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MIOCENE OSTRACODES OF THE PELOTAS BASIN, STATE OF RIO GRANDE DO SUL, BRASIL

Yvonne T. Sanguinetti *

SINOPSE

No presente trabalho é feito o estudo taxonômico de vinte e um gêneros de ostracodes, de idade miocênica, representados por vinte e cinco espécies, treze das quais novas para o grupo. Estes ostracodes provêm de oito perfurações realizadas pela Petróleo Brasileiro S.A. — PETROBRÁS — na Bacia de Pelotas, Rio Grande do Sul.

ABSTRACT

This paper discusses, taxonomically, twenty-one genera of ostracodes (Miocene age) represented by twenty-five species, thirteen of which new for the group. This material came from eight drillings made by Petróleo Brasileiro S.A. — PETROBRÁS — in the Pelotas Basin, State of Rio Grande do Sul, Brasil.

INTRODUCTION

This paper presents a study of the Miocene ostracodes obtained from eight drillings made by PETROBRÁS, in the Pelotas Basin, located in the State of Rio Grande do Sul, Brasil. (Fig. 1).

It is the first study with ostracodes in the Pelotas Basin and the first part of the author's Doctoral Thesis, presented in 1974, at the Universidade Federal do Rio Grande do Sul. The emphasis of the Thesis was on biostratigraphical correlation. However, here only the Systematic Descriptions and the corresponding biozone of the ostracodes are presented. The biostratigraphical study will be published in the same Journal under the title: Bioestratigrafia (Ostracodes) do Mioceno da Bacia de Pelotas, Rio Grande do Sul.

PELOTAS BASIN

General Considerations

The Pelotas Basin (Fig. 1) — name proposed by Ghignone (1960) — is situated on the eastern part of the Rio Grande do Sul Coastal Plain, having a general direction NE-SW, approximately between the coordinates: Lat. 34°S and Long. 54°W, stretching towards the east in the Oceano Atlântico. The same author mentions an area of 30,000 km² for the Basin. Delaney (1965) referring also to the extension, says: "At present, the Basin is believed to have an area of 45,000 km²."

The drillings made by PETROBRÁS show that the greatest thickness of the Basin is located on the eastern part where, at times, it reaches a depth of 1,000 m, while on the western part the maximum limit is 300 m.

The predominant lithology is made up of mudstones and loose or consolidated sandstones, with sporadic occurrence of silt, pebbles and calcareous rocks (chalk). In subsurface, the sediments

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present invertebrate fossils that show a marine environment in the deeper beds, and alternated marine, mixohaline and freshwater in the more superficial ones.

In the surface, occurrences of Pleistocene mammals were registered by Couto (1944) and Cunha (1959). Another paper on mammals written by Couto and Cunha (1965) also refers this fauna as corresponding to the Upper Pampeano of the Upper Pleistocene of Argentina. Pleistocene ostreides were studied by Bianchi (1969) and Holocene mollusks, by Closs and Forti (1971).

Boreholes

Figure 1 shows the location of the eight perforations made by PETROBRÁS, during the years between 1958 and 1964.

Material originated from the boreholes samples was sent to Seção de Micropaleontologia of the Universidade do Rio Grande do Sul, by the above mentioned Company, thus making possible the studies done by Closs (1966, 1967, 1970) with foraminíferes, by Forti (1969) with mollusks and the present study, with ostracodes.

Palinological studies of three boreholes were made by Daemon (1969).

Before referring to the location, the following explanation should be given:

The GAs-1-RS drilling, due to technical problems was abandoned in the 102m (Ghignone, 1960). PETROBRÁS started then a second perforation: GAs-1A-RS, 2m far from the first one and from which material was drilled starting at a depth of 102m. Having PETROBRÁS kept the first symbol: GAs-1-RS, in its Reports, the same criterion was here adopted. However, it is important to explain that later on, PETROBRÁS changed the symbol formerly used in its perforations. Thus, the use of the present symbol is kept there, while the former one is always given in parenthesis.

2-PJ-1-RS (PJst-1-RS) – Location: Ponta do Juncal, 25 km south of Jaguarão county. Geographic coordinates: Lat. 32°36'10"S, Long. 53°09'10"W. Depth: 175.20m.

2-CA-1-RS (CAst-1-RS) – Location: Curral Alto, about 230 km from Camaquã county, between the Lagoas Mirim and Mangueira. Geographic coordinates: Lat. 32°55'34"W, Long. 52°44'47"W. Depth: 320.20m.

2-CI-1-RS (CIst-1-RS) – Location: Rio Grande County, 2 km southwest from the sea summer resort Cassino. Geographic coordinates: Lat. 32°12'00"S, Long. 32°10'30"W. Depth: 572.20m.

2-PN-1-RS (PNst-1-RS) – Location: Between Pelotas and Rio Grande counties, 4,5 km northeast from a little county: Porto Novo. Geographic coordinates: Lat. 31°57'00"S, Long. 52°17'00"W. Depth: 267.20m.

2-GA-1-RS (GAs-1-RS) – Location: In the place formerly called Guaraxaim and later on changed to Graxaim, 37 km east from Camaquã. Geographic coordinates: Lat. 31°01'40"S, Long. 51°33'46"W. Depth: 165.15m.

2-GA-2-RS (GAs-2-RS) – Location: Also in Graxaim, approximately 28 km southeast from Camaquã. Geographic coordinates: Lat. 30°56'57"S, Long. 51°35'41"W. Depth: 251.25m.

2-MO-1-RS (MOst-1-RS) – Location: 7,5 km from Mostardas county and 200m from the Lighthouse bearing the same name. Geographic coordinates: Lat. 31°14'45"S, Long. 50°54'18"W. Depth: 1,570.20m.

2-PS-1-RS (PSst-1-RS) – Location: 2 km northeast from the Palmares do Sul county. Geographic coordinates: Lat. 30°10'39"S, Long. 50°29'30"W. Depth: 414.20m.

REPOSITORY

Type material was catalogued and deposited in the collections of the Museu de Paleontologia, Universidade Federal do Rio Grande do Sul (MP-0-398 to 470, UFRGS).

SYSTEMATIC DESCRIPTIONS

Phylum Arthropoda
Sub Phylum Mandibulata
Classis Crustacea
Sub Classis Ostracoda Latreille, 1806
Ordo Podocopida Müller, 1894
Sub Ordo Podocopina Sars, 1865
Super Família Bairdiacea Sars, 1888
Família Bairdiidae Sars, 1888

Genus *Bairdoppilata* Coryell, Sample et Jennings, 1935

Diagnosis: Carapace small, smooth, or finely punctate; bairdiaoid in lateral view; left valve is larger and overlaps the right on all margins, but more on the dorsal and midventral than elsewhere. The ventral margin of each valve may not be frilled. The hingement of the left valve consists of a groove and an adjacent ridge on the dorsal margin; along the dorsal margin to the anterior angulation, the groove structure disappears before the middle of each slope is reached; just dorsal of the angulations on each end of the valve and within the overlapping margin, there is a short series of transverse teeth and sockets, supported upon the internal marginal platform. The hingement of the right valve consists of a barlike ridge with a groove along its dorsal side which fits into the articulating structure of the left valve, and also a series of teeth set upon the margin of the valve just above the terminal angulations to mesh with those of the left valve.

Species typus — *Bairdoppilata martyni* Coryell, Sample et Jennings, 1935, p.3, pl.1-2.

Bairdoppilata triangulata Edwards, 1944

Plate 1, figures 1a-c; Plate 9, figure 1

Holotypus: United States National Museum (U.S.Nat.Mus.) n. 559411

Locus typicus: Locality 1, Natural Well near Magnolia, Duplin County, North Carolina, USA

Stratum typicum: Duplin Marl, Upper Miocene

Homotypi: Complete carapace n. MP-0-398, Right valve n. MP-0-458

Locus: Pelotas Basin, State of Rio Grande do Sul, Brasil. PETROBRÁS, Drilling 2-CI-1-RS, core 5 (505-506m)
Stratum: Subzone *Krithe trinidadensis*, Zone *Henryhowella evax* (Miocene)

Description: External view — Carapace smooth. In lateral view elongate. Anterior border rounded, flattening dorsally and forming a small angle with the dorsal border; posterior border slightly acute. Left valve bigger than the right, overlapping it along the dorsal border and the median portion of the ventral border. Valves swollen in the median part of the valve. Seen dorsally, the carapace is oviform, with slight overlap of the right valve in the midposterior area.

Internal view — Right valve — Dorsal border straight inflecting more abruptly to the posterior than to the anterior border. Marginal zone wide and smooth. Hinge characteristic for the genus i.e., with well distinct lateral dentition. Great number of very small muscle scars of difficult observation, forming a circular spot.

Dimensions

Homotypi — Complete carapace: length 1.19mm; height 0.76mm; width 0.32mm
Right valve: length 1.21mm; height 0.78mm

Discussion: The present form does not have a very light crenulation in the ventral border as it occurs with some forms of *Bairdoppilata triangulata* Edwards. As this difference does not seem important, it was considered as belonging to the same species.

Occurrence: Duplin and Robeson County, North Carolina; Liberty and Leon County, Florida, USA. Pelotas Basin, State of Rio Grande do Sul, Brasil Drillings of PETROBRÁS: 2-GA-1-RS, cores 36 (126,35 — 129,40m), 39 (133,40 — 138,98m); 2-MO-1-RS, cores 5 (506m), 7 (716m); 2-CI-1-RS, cores 4 (405 — 408m), 5 (505 — 506m); 2-PS-1-RS, core 5 (270 — 273m).

Super Família Cypridacea Baird, 1845
Família Paracyprididae Sars, 1923

Genus *Paracypris* Sars, 1865

Diagnosis: Valvulae testae glabrae, durissimae, pilis fere omnino destitutae, a latere visae antice quam postice multo altiores. Antennae superiores breviter pilosae; inferiores robustae, unguibus terminatae 4 fortibus, quorum 2 ex articulo penultimo ante ceteros duos prodeunt; articulo antepenultimo fasciculo setarum longarum destituto. Mandibulae magnae ad extremitatem inferiorem in dentes 5-6 obtusos divisae, palpo elongato, appendice branchiali angusta. Lobus externus vel palpus maxillarum primi paris linearis ceteris vix latior. Maxille 2di paris appendice branchiali distincta palpo elongato conico minimeque articulo. Pedes ultimi paris anterioribus et forma et magnitudine similes et ex valvulis ut illi pro parte porrigi possunt; paria ambo elongate distincte 5-articulata, articulo ultimo ungui longo et curvato et in ultimo pari praeterea seta brevior supra vergente armata. Rami postabdominales sat magni, ad apicem unguibus 2 setaeque parva, ad marginem posticum prope apicem setis 2 supra curvatis instructi. Oculi unus distinctus.

Species typus — *Paracypris polita* Sars, 1865, p.12

Paracypris sp.

Plate 1, figures 2a-c; Plate 9, figures 2a-b

Hypotypi — Left valve n. MP-0-399. Right valve n. MP-0-400. Complete carapace n. MP-0-459.

Locus: Pelotas Basin, State of Rio Grande do Sul, Brasil PETROBRÁS Drilling, 2-GA-2-RS, core 6 (111,55 — 114,60m).

Stratum: Subzone *Hemicytherura howei*, Zone *Henryhowella evax* (Miocene).

Description: External view — Carapace smooth. In lateral view, well elongate. Valves unequal: right valve larger than the left. Greater height at the middle portion of the valves. Dorsal border curve inclining backwards, smoothly in the left valve; anterior border obliquely rounded; posterior border sharpen.

Internal view — Left valve — Dorsal border curved; anterior border obliquely rounded; posterior border sharpen and ventral border almost straight with the lip well distinct. Hinge with hinge groove along the dorsal border and slightly stronger at the lateral portions. Marginal zone wide, especially at the anterior and posterior borders; great number of marginal pore canals, simple or ramified. Vestibule well developed. Normal pore canals scattered. Ten muscle scars quite clear, being six median: four more or less equal in size and two bigger and upward, and four anterior and smaller.

At the right valve the dorsal border is curved and slightly penetrating in the lateral portions. Hinge with bar.

Dimensions

Hypotypi — Left valve: length 0.95mm; height 0.37mm
Right valve: length 0.94mm; height 0.35mm
Complete carapace: length 0.70mm; height 0.28mm; width 0.26mm

Discussion: Similar to *Paracypris meridionalis* Lyubimova et Mohan, 1960 of the Lower Miocene of India. Differs slightly in having the biggest height in the posterior portion. It was not possible to determine the species because in the description of *P. meridionalis* the dorsal view of the carapace and the internal view of the valves are not represented.

Occurrence: Pelotas Basin, State of Rio Grande do Sul, Brasil. Drillings of PETROBRÁS: 2-GA-1-RS, cores 36 (126,35 — 129,40m), 38 (132,45 — 133,40m), 39 (133,40 — 138,98m); 2-GA-2-RS, core 6 (111,55 — 114,60m); 2-MO-1-RS, cores 5 (506 — 508m), 12 (1,185m); 2-PJ-1-RS, core 2 (132,05m).

Super Família Cytheracea Baird, 1850

Família Cytheridae Baird, 1850

Sub Família Rocaleberidinae Bertels, 1969

Genus *Rocaleberis* Bertels, 1969

Diagnosis: Caparazón en vista lateral subrectangular, con bordes anterior y posterior redondeados; en vista lateral ovoide; tubérculo ocular fuertemente desarrollado, depresión postocular presente, tubérculo subcentral marcado; ornamentación primaria consistente en tres suaves pliegues longitudinales y superficie cubierta por un reticulado sobre el cual secundariamente pueden superimponerse pequeños tubérculos; tubérculos o denticulaciones marginales presentes.

Species typus — *Tocaleberis nascens* Bertels, 1969, tomo 6 n.º 2, p.162-164, Lam. I, fig.1a-d; Lam. v, fig.1a-c.

Rocaleberis bertelsae Sanguinetti, sp. nov.

Plate 1, Fig. 3a-f; Plate 9, Fig. 3a-b

Derivatio nominis: In honor of Dr. Alwine Bertels, Universidad de Buenos Aires, Argentina

Holotypus: Female — Complete carapace n. MP-0-401 A, B

Paratypus: Male — Complete carapace n. MP-0-402 A, B

Locus typicus: Pelotas Basin, State of Rio Grande do Sul, Brasil PETROBRÁS Drilling 2-GA-1-RS, core 37 (126,40 — 131,45m)

Stratum typicum: Subzone *Henryhowella howei*, Zone *Hemicytherura evax* (Miocene)

Diagnosis: Carapace covered by small laminated or pointed spines. Slight dorsomedian longitudinal sulcus.

Description: External view — Carapace in lateral view subrectangular. Dorsal border straight and denticulated; anterior and posterior borders rounded. Ventral border slightly oblique. Eye tubercle and post-ocular depression distinct. Carapace surface covered by small spines ending in a point or lamina, and presenting a slight dorsomedian longitudinal sulcus. Sometimes the spines are fused forming small tubercles; at the anterior border, spines disposed along the marginal zone forming a crenulation.

Median depression surrounding a small cluster of spines. The left valve presents, near the anterior cardinal border, a bigger height than the right valve. The carapace is ovoid in dorsal view. Sexual dimorphism present, being the males sharper than the females.

Internal view — Right valve — Dorsal border sinuous. Hinge straight, with an anterior tooth with wide base and somewhat triangular shape, followed by a socket, crenulate hinge groove and elongate posterior tooth. Wide marginal zone with simple or ramified pore canals. Vestibule along all marginal zone. Normal pore canals scattered. Four muscle scars, disposed in line and one anterior in U — shaped, visible only in the right valve.

Dimensions

Holotypus — Female

Left valve: length 0.90mm; height 0.51mm

Right valve: length 0.89mm; height 0.50mm

Paratypus — Male

Left valve: length 0.89mm; height 0.48mm

Right valve: length 0.98mm; height 0.48mm

Discussion: Compared with type material of *R. nascens* Bertels, 1969 of the Miocene of Argentina. Differs from that species in having the posterior border obliquely rounded at the posteroventral angle. But, it differs, mainly, due to the type of sculpture: the present species has the surface of the carapace covered with small spines, normally pointed and sometimes flattened or fused and flattened. Another difference from *Rocaleberis nascens* is the presence of a slight longitudinal dorsomedian sulcus along which the sculpture of the carapace seems to be interrupted.

Occurrence: Pelotas Basin, State of Rio Grande do Sul, Brasil. Drillings of PETROBRÁS: 2-GA-1-RS, core 37 (129,40 — 132,45m); 2-CI-1-RS, core 4 (405 — 408m); 2-PN-1-RS, core 4 (202 — 205m); 2-PJ-1-RS, core 2 (132,05m).

Rocaleberis sylvesterbradleyi Sanguinetti, sp. nov.

Plate 2, figures 1a-e; Plate 9, figure 4

Derivatio nominis: In honor of Dr. J.P. Sylvester — Bradley, University of Leicester, England

Holotypus: Female — Left valve n. MP-0-403

Paratypi: Male — Left valve n. MP-0-404
Female — Right valve n. MP-0-405

Locus typicus: Pelotas Basin, State of Rio Grande do Sul, Brasil PETROBRÁS Drilling 2-MO-1-RS, core 7 (716m)

Stratum typicum: Subzone *Krithe trinidadensis*, Zone *Henryhowella evax* (Miocene).

Diagnosis: Carapace tumid with reticulate surface and spines irregularly distributed over it. Sulcus distinct following the shape of the anterior border. Eye tubercle salient and well developed.

Description: External view — Carapace in lateral view tumid and subquadrangular in shape. Dorsal border sinuous; anterior border obliquely rounded and crenulated; ventral border also obliquely rounded, but narrower than the anterior. Eye tubercle highly developed. Reticulate carapace surface; above the reticula, small spines are irregularly disposed. Anteriorly, two rows of reticula follow the shape of the border. At the median portion of the valve exists a small anteromedian depression, circular, surrounding a cluster of spines. Sexual dimorphism present: the female is more inflated. Proportionally it is higher at the anterior cardinal angle and wider at the posterior area.

Internal view — Right valve — Dorsal border sinuous. Hinge straight with an anterior tooth with wide base and a somewhat triangular shape; an elongate socket, crenulate hinge groove and simple and elongate posterior tooth. Marginal zone wide; simple or ramified pore canals, scattered all over the free margin. Narrow vestibule. Normal pore canals scattered. Four muscle scars in line and one anterior.

Dimensions

Holotypus — Female

Left valve: length 0.98mm; height 0.61mm

Paratypes — Female

Right valve: length 0.97mm; height 0.60mm

Male

Left valve: length 1.15mm; height 0.63mm

Discussion: Similar to *R. bertelsae* sp. nov. differing in the following aspects: type of ornamentation rougher; tumid valves; distinct sulcus following the anterior border; eye tubercle well salient and bigger in size.

Occurrence: Pelotas Basin, State of Rio Grande do Sul, Brasil. Drillings of PETROBRÁS: 2-MO-1-RS, cores 7 (716m), 12 (1,185m); 2-CA-1-RS, core 50 (248,70 — 254,80m); 2-CI-1-RS, cores 3 (307 — 309m), 4 (405 — 408m); 2-GA-1-RS, core 39 (133,40 — 138,98m).

Família Cytherettidae Triebel, 1952

Genus *Cytheretta* Müller, 1894

Diagnosis: The genus is closely related to *Cythereis*, but is different in following points: The inner margin has a very irregular course, forms in front an “S” formed line, at the ventral margin, below the contractor appendages, it forms a conical figure, behind which it forms an irregular, flat arch, open towards the bottom. It coincides completely with the line of concrescence. Spinning bristle of the 2nd antenna in both sexes with 3 segments. Leg 1 of male at the hind margin without bristles; leg 2 of male and female at the front margin with one bristle.

Species typus — *Cytheretta rubra* Müller, 1894, p.587-588, Taf. 8, Fig. 9, 10, 13, 16; Taf. 39, Fig. 8-22, 24. (of the translation to English language).

Cytheretta punctata Sanguinetti, sp. nov.

Plate 2, figures 2a-e; Plate 9, figures 5a-b

Derivatio nominis: Due carapace surface with punctae

Holotypus: Female — Complete carapace n. MP-0-406 A, B

Paratypi: Female — Complete carapace n. MP-0-407

Male — Complete carapace n. MP-0-408

Locus typicus: Pelotas Basin, State of Rio Grande do Sul, Brasil PETROBRÁS Drilling 2-PN-1-RS, core 4 (202 — 205m).

Stratum typicum: Subzone *Hemicytherura howei* Zone *Henryhowella evax* (Miocene).

Diagnosis: Valves unequal: left valve ovoid, right valve ovoid-elongate. Wide longitudinal ridges, light and intercalated by punctae.

Description: external view — Left valve ovoid in lateral view, with curve dorsal border and strong reentrance at the posteromedian portion; ventral border slightly sinuous; anterior border oblique and posterior slightly sharpened at the median portion. Right valve ovoid-elongate with curve dorsal border and slight re-entrance at the anterodorsal area; anterior border oblique, posterior slightly sharp. Carapace surface with smooth, wide and longitudinal ridges semicontinuous; at some areas the valves are smooth. Between the ridges, rows of punctae normally in pairs, but sometimes in group. Sexual dimorphism distinct: female with the valves higher and wider.

Internal view — Right valve — Dorsal border slightly sinuous. Straight hinge formed by one anterior tooth prominent with wide and sharp-base, follow socket and crenulate hinge groove and simple and elongate tooth. Anterior and posterior borders obliquely rounded; ventral border somewhat straight; sinuous marginal pore canals, simple or ramified, more numerous in the anterior border. Four muscle scars in vertical line and one anterior in a somewhat half-moon shape. Left valve with curved dorsal border. Some specimens measuring up to 0.85mm in length. The present holotype and paratypes are smaller in length, but were selected for being complete carapaces because the valves in this species are very unequal.

Dimensions

Holotypus — Female

Left valve: length 0.76mm; height 0.39mm

Right valve: length 0.75mm; height 0.37mm

Paratypi — Female

Complete carapace: length 0.72mm; height 0.38mm; width 0.32mm

Male

Complete carapace: length 0.74mm; height 0.37mm; width 0.30mm

Discussion: Similar to *Cytheretta alexanderi* Howe et Chambers, 1935 — eocenic species, differs in the following aspects: valves also unequal but without any overlapping which is well visible in *C. alexanderi*; and longitudinal ridges wide, interrupted and intercalated by well distinctive punctae. *C. punctata* holotype is a female. *C. alexanderi* seems also be a female due to its length-height proportion, but their authors do not mention any dimorphism.

Occurrence: Pelotas Basin, State of Rio Grande do Sul, Brasil. Drillings of PETROBRÁS: 2-PN-1-RS, core 5 (270 — 273m); 2-GA-2-RS, cores 6 (111,55 — 114,60m), 8 (117,65 — 120,70m); 2-PN-1-RS, core 4 (202 — 205m).

Genus *Bensonia* Rossi de Garcia, 1969 emend. Sanguinetti, 1979

Grekoффiana Rossi de Garcia, 1969 p. 219-220, Pl.II,
Fig. 1a-c

Argenticytheretta Rossi de Garcia, 1969, p.220-221,
Pl. I, Fig. 2; Pl. II, Fig. 2a-b.

Diagnosis: Carapace subrectangular in shape. Surface covered with rounded or elongate punctae linearly or concentrically arranged forming a slight or well developed ridges or striae. Hinge holamphidont. Marginal zone with many simple radial pore canals.

Species typus — *Cytheretta argentinensis* Rossi de Garcia, 1966, p.206-207, Lam. II, fig. 4a-b.

Discussion: Rossi de Garcia has created three genera: *Bensonia*, *Grekoффiana* and *Argenticytheretta* in the same paper of 1969. By her diagnosis and descriptions, only small details of internal and external views of the carapaces, they seem be new species and not new genera. The present author was able to examine specimens of *Bensonia* from the Miocene of Argentina, for comparison, and it was possible to define the characteristics of the genus and to conclude that the forms here determined belong to *Bensonia*. Because it was not possible to find any form to distinguish between the genera *Grekoффiana* and *Argenticytheretta* from *Bensonia*, the present author here proposes *Grekoффiana* and *Argenticytheretta* as synonymous with *Bensonia* by priority.

Bensonia midipunctata Sanguinetti, sp. nov.

Plate 3, figures 1a-f; Plate 10, figures 1a-b

Derivatio nominis: Due to carapace surface with punctae of median size

Holotypus: Female — Left valve

n. MP-0-409

Paratypes: Female — Right valve

n. MP-0-410. Left valve (juvenile stage)

n. MP-0-411. Complete carapace

n. MP-0-413.

Male — Left valve (juvenile stage)

n. MP-0-412. Complete carapace

b. MP-0-414

Locus typicus: Pelotas Basin, State of Rio Grande do Sul, Brasil PETROBRÁS Drilling 2-PN-1-RS, core 4 (202 — 205m)

Stratum typicum: Subzone *Hemicytherura howei*, Zone *Henryhowella evax* (Miocene).

Diagnosis: Longitudinal ridges well distinct, intercalated by round or elongated punctae, arranged linearly.

Description: External view — Unequal valves. In lateral view presents subrectangular elongate form. Dorsal border straight and bent backwards in the left valve; in right valve sinuous; anterior and ventral borders obliquely rounded; posterior border straighter than anterior one, but also rounded and more pointed at the right valve. Left valve strongly higher close to anterior cardinal angle; strong transversal re-entrance in posterodorsal portion. Valves present a convexity in median portion which, when seen laterally, overlaps part of dorsal and ventral borders, especially in the right valve. Left valve bigger than right presenting overlap close to anterior and posterior cardinal angles and along ventral border. Eye tubercle not visible, but one small inclined re-entrance occurs in its corresponding zone. Carapace surface with well distinct longitudinal and concentric ridges, intercalated by rounded or elongate punctae well developed and arranged linearly, diminishing in size in proportion to its proximity to borders, mainly anterior and posterior ones. Valves with thin crenulation in anteroventral portion. Valves slightly crenulated in posterior portion. Sexual dimorphism observed in juvenile stage (Pl. 3, fig. 1c, 1e) when females are already taller and more inflated than males. Adult specimens with distinct dimorphism.

Internal view — Right valve — Dorsal border curved. Straight hinge formed by an anterior tooth with wide and pointed base followed by elongate socket, hinge groove crenulated and posterior tooth simple and elongate. Marginal zone with simple, straight and sinuous pore canals, more numerous in anterior border. Normal pore canals scattered almost always marked by punctae. Four muscle scars, arranged in rows and one anterior.

Dimensions

Holotypus — Female

Left valve: length 0.79mm; height 0.45mm

Paratypes — Female

Right valve: length 0.78mm; height 0.44mm

Left valve (juvenile stage): length 0.68mm; height 0.40mm

Complete carapace: length 0.85mm; height 0.45mm; width 0.43mm

Male

Left valve (juvenile stage): length 0.68mm; height 0.35mm

Complete carapace: length 0.87mm; height 0.45mm; width 0.42mm

Discussion: Present species, like the two following ones, were determined as *Bensonina* because it was possible to establish a comparison with species originated from the type locality (Miocene from Argentina). These specimens, according to oral communication by Rossi de Garcia to Dr. A. Bertels, belong to a *Bensonina* species not yet described. It was then possible to check the coincidence of internal characters for the species here studied. Externally, *B. midipunctata* was compared to *B. argentinensis* Rossi de Garcia, 1969, and it differs in presenting thinner and less salient ridges as well as smaller punctae. It was also compared to *B. miocenica* (Rossi de Garcia, 1969), but presents ridges with less linear disposition and punctae with a different form and smaller in size, too.

Occurrence: Pelotas Basin, State of Rio Grande do Sul, Brasil. Drillings of PETROBRÁS: 2-PN-1-RS, core 4 (202 — 205m); 2-MO-1-RS, core 12 (1.185m); 2-GA-1-RS, cores 34 (120,25 — 123,30m), 36 (126,35 — 129,40m); 2-PS-1-RS, core 5 (270 — 273m).

Bensonina minipunctata Sanguinetti, sp. nov.

Plate 3, figures 2a-e; Plate 10, figures 2a-b

Derivatio nominis: Due to carapace surface with punctae of small size

Holotypus: Male — Complete carapace n. MP-0-415 A, B

Paratypi: Female — Left valve n. MP-0-416. Complete carapace n. MP-0-469.

Male — Complete carapace n. MP-0-470

Locus typicus: Pelotas Basin, State of Rio Grande do Sul, Brasil. PETROBRÁS Drilling, 2-GA-1-RS, core 8 (117,65 — 120,70m)

Stratum typicum: Subzone *Hemicytherura howei*, Zone *Henryhowella evax* (Miocene).

Diagnosis: Thin longitudinal ridges intercalated by small punctae sometimes arranged in pairs and sometimes disorderly.

Description: External view — The outline of carapace is similar to *B. midipunctata* sp. nov. The carapace presents longitudinal ridges which are thin and smooth, sometimes indistinct, intercalated by punctae of small size arranged in pairs sometimes geometrically and sometimes disorderly. Punctae diminish in size near the anterior and posterior borders. Sexual dimorphism distinct, the female being taller and more inflated than the male.

Internal view — All hinge characters, marginal zone and muscular scars coincide with those of *B. midipunctata* as observed in Plate 10 figures 1a-b and 2a-b.

Dimensions

Holotypus — Male

Right valve: length 0.88mm; height 0.43mm;

Left valve: length 0.89mm; height 0.47mm

Paratypi — Female

Left valve: length 0.86mm; height 0.47mm;

Complete carapace: length 0.76mm; height 0.41mm; width 0.29mm

Male

Complete carapace: length 0.75mm; height 0.38mm; width 0.29mm

Discussion: Differs from *Bensonina midipunctata* in the following aspects: carapace sculpture more delicate. Longitudinal ridges distinct too, but thinner, almost striae. Punctae also of small size and in a greater number. On the other hand, the punctae are well arranged two by two or disorderly and intercalated between the ridges.

Occurrence: Pelotas Basin, State of Rio Grande do Sul, Brasil Drillings of PETROBRÁS: 2-GA-2-RS, cores 6 (111,55 — 114,60m), 8 (117,65 — 120,70m), 9 (120,70 — 123,73m); 2-PN-1-RS, core 4 (202 — 205m); 2-CI-1-RS, cores 3 (307 — 309m), 4 (405 — 408m); 2-PS-1-RS, core 5 (270 — 273).

Bensonina tripunctata Sanguinetti, sp. nov.

Plate 4, figures 1a-d; Plate 10, figures 3a-b

Derivatio nominis: Due to carapace surface with punctae arranged in groups of three

Holotypus: Left valve n. MP-0-417

Paratypi: Right valve n. MP-0-418. Left valve n. MP-0-419.

Locus typicus: Pelotas Basin, State of Rio Grande do Sul, Brasil. PETROBRÁS Drilling 2-PN-1-RS, core 4 (202 – 205m)

Stratum typicum: Subzone *Hemicytherura howei*, Zone *Henryhowella evax* (Miocene).

Diagnosis: Valves unequal: left subquadrangular and right subrectangular. Sinuous ridges subparallel intercalated by punctae normally arranged in groups of three, forming triangles.

Description: External view — Left valve subquadrangular with dorsal border slightly sinuous and distinct re-entrance in mid-posterior portion; anterior and posterior borders rounded; ventral border almost straight. Right valve more inflated and subrectangular, with curved dorsal border; anterior border rounded; ventral rather straight up to two-thirds in its length, bending upwards without forming an angle with the posterior border. Valves are crenulated in anterior and posterior borders. Carapace surface with sinuous ridges, sub-parallel and semi-concentric. Intercalated punctae are seen being irregular in size, normally in groups of three, forming triangles more or less interlinked, its carapace having an aspect of a meshwork.

Internal view — All the internal characters of the hinge, marginal zone and muscular scars coinciding with those of the two former species, as seen in Plate 10, figures 3a-d.

Dimensions

Holotypus — Left valve: length 0.91mm; height 0.48mm

Paratypi — Right valve: length 0.90mm; height 0.45mm
Left valve: length 0.87mm; height 0.44mm

Discussion: Compared with *Bensonia minipunctata* differs in the following aspects: right valve subrectangular and left subquadrangular. Sculpture consisting of subparallel and semiconcentric ridges of irregular size, punctae arranged in groups of three, thus presenting a more coarse sculpture. Figure 1d of Plate 4 shows a valve with a slight variation in the characteristic sculpture of the species.

In the three *Bensonia* species here described, much variation of sculpture between specimens of the same species was observed.

Occurrence: Pelotas Basin, State of Rio Grande do Sul, Brasil PETROBRÁS Drilling 2-PN-1-RS, core 4 (202 – 205m).

Família Cytherideidae Sars, 1925

Sub Família Krithinae Mandelstam, 1958

Genus *Krithe* Brady, Crosskey et Robertson, 1874.

Ilyobates Sars, 1865 (non *Ilyobates* Kraatz, 1858).

Diagnosis: Valves thin and pellucid, subovate, truncate behind; smooth and shining, and set with very small distant papillae. Hinge-joint simple, formed by a slight projection of the left valve, which is received into a corresponding depression of the right. Upper antennae very stout, five jointed, the first two joints much thickened, the last three short and bearing long curved spines; lower antennae four-jointed. Mandibles small, with unusually long slender teeth; palp three-jointed, the second joint elongated, "branchial appendage having two long ciliated setae and one rudimentary". Maxillae of the usual form. Feet very short; the first two pairs three-jointed, the last pair four-jointed. "Right foot of the last pair in the male prehensile and only three-jointed, terminal claw very wide and strong. Abdomen of the female very convex above the postabdominal lobes bearing two short hairs". Eyes wanting.

Species typus — *Ilyobates praetexta* Sars, 1865, p.60-61.

Krithe trinidadensis van den Bold, 1958

Plate 4, figures 2a-b; Plate 10, figures 4a-b

Holotypus: U.S.Nat. Mus. n. 562059.

Locus typicus: Favre, Sample 56a, 4.2 miles east of Rio Claro, south of the road Naparima-Mayaro Trinidad

Stratum typicum: Cipero Formation (*Globorotalia fohsi lobata* Zone), Miocene

Homotypi: Female — Right valve

n. MP-0-420. Left valve n. MP-0-421

Locus: Pelotas Basin, State of Rio Grande do Sul, Brasil PETROBRÁS Drilling

2-MO-1-RS, core 5 (505 — 506m)

Stratum: Subzone *Krithe trinidadensis* Zone *Henryhowella evax* (Miocene).

Description: External view — Valves unequal. In lateral view presents elongate oval form, higher in median portion. Anterior border rounded, posterior vertically truncated more marked in the left valve; dorsal border curved in left valve and undulated in right. Smooth carapace with scattered normal pore canals. Right valve with slight re-entrance close to anterior cardinal angle. Overlap not observed because complete and well preserved carapace does not occur, but right valve is higher than left. Absence of males.

Internal view — Right valve — Simple hinge with elongate and curved bar. Wide marginal zone in anterior border, simple short and interlinked marginal pore canals more numerous in anteroventral portion; posterior border almost straight. Four muscle scars arranged in vertical row and two anterior.

Dimensions

Homotypi — Female

Right valve: length 0.72mm; height 0.37mm

Left valve: length 0.72mm; height 0.35mm

Discussion: The present form only presents females and has all characters of *Krithe trinidadensis* van den Bold, 1958.

Occurrence: Trinidad. Pelotas Basin, State of Rio Grande do Sul, Brasil. Drillings of PETROBRÁS: 2-MO-1-RS, cores 5 (506 – 508m), 6 (611m), 7 (716m), 9 (926,50m); 2-CA-1-RS, core 50 (248,70 – 254,80m); 2-PJ-1-RS, core 2 (132,05m).

Familia Cytheruridae Müller, 1894

Genus *Cytheropteron* Sars, 1865 emend. Sanguinetti, 1979

Diagnosis: Valvulae testae inaequales et forma dissimili, dextra sinistram in medio marginis dorsalis plus minusve superante superficie minime reticulata sed foveolis parvis rotundatis ornata, latus ventrale propius eminentiam magnam lateralem alaeformen paraebentes, postice ut in genere antecedente (*Cytherura* Sars) in processum obtusum exsertae. Commissura dorsalis efficitur dentibus valvulae dextrae duobus ad extremitatem lineae cardinales et crista valvulae sinistrae mediana magna et subtiliter dentata. Antennae superiores breviter pilosae ex 5 modo compositae articulis, penultimo elongato et in medio marginis anterioris pilis 2 obsito; inferioris distinct 5 articulatae, flagello longo. Mandibulae mediocres, palpo 3 articulado appendice branchiali minima setis 2 instructa. Maxillae fere ut in genere antecedente (*Cytherura*). Pedes tenues et elongati gracili. Abdomen processu longo et tenui terminatum, lobis postabdominalibus brevibus pilis 3 obsitis. Organa copulationis maris postice processibus 3 spinaeformibus, quorum unus trifurcatus armata. Oculi nulli.

Species typus – *Cythere latissima* Norman, 1865, p.19, Pl. 6, fig. 5-8, designated by Brady and Norman, 1889, p.207.

Discussion: Sars, 1865 states that the *Cytheropteron* genus does not present eye tubercle. However, in a great number of *Cytheropteron* species the authors show it, and in the specimens here studied it is also visible.

Then, the present author formally proposes an emendation: the inclusion of the morphological character – eye tubercle – to the generic diagnosis of Sars, 1865.

Cytheropteron tuberculatum Sanguinetti, sp. nov.

Plate 4, figures 3a-e; Plate 11, figures 1a-b

Derivatio nominis: Due the presence of eye tubercle

Holotypus: Complete carapace
n. MP-0-422 A, B

Paratypes: Complete carapace (juvenile stage) n. M-0-423 A, B. Complete carapace
n. MP-0-424

Locus typicus: Pelotas Basin, State of Rio

Grande do Sul, Brasil PETROBRÁS Drilling 2-GA-1-RS, core 39 (113,40 – 139,98m)

Stratum typicum: Subzone *Hemicytherura howei*, Zone *Henryhowella evax* (Miocene).

Diagnosis: Carapace outline losangular sinuous; smooth surface, furrows originated from sinuous ridges irregularly arranged. Eye tubercle.

Description: External view — In lateral view carapace small, inflated with sinuous outline. Unequal valves. Right valve with dorsal border also bent forwards and backwards; anterior border obliquely rounded; ventral border partially covered by alar process projection; posterior border sharpened forming small caudal process. Left valve with dorsal border unequally inclined: forwards strongly, joining anterior border which is wide and oblique; backwards slightly, being sinuous; posterior border rounded and truncated, without caudal process.

Carapace surface smooth and furrowed; furrowing originates from small, sinuous longitudinal and transversal ridges: biggest ventral ridge covers four-fifths of valve, forming small alar process; second ridge, central, spreads from anterior border to median valve portion; third ridge, mid-dorsal, forms small elevation in this area. Smooth eye tubercle. In dorsal view, light overlap of right valve over left in median portion of carapace is observed, being left valve higher next to anterior cardinal angle.

Internal view — Right valve — Dorsal border sinuous and bent backwards. Hinge also sinuous with anterior and posterior teeth crenulated; hinge groove also crenulated. Wide marginal zone; marginal pore canals in small number, distributed all over marginal zone, straight at times sinuous and interlinked. Vestibule distinct. Normal pore canals scattered. Four muscle scars visible and rather linearly arranged. In left valve they form groups.

Dimensions

Holotypus — Left valve: length 0.39mm; height 0.23mm

Right 0.40mm; height 0.21mm

Paratypes — Left valve (juvenile stage): length 0.34mm; height 0.19mm

Right valve (juvenile stage): length 0.35mm; height 0.18mm

Complete carapace: length 0.40mm; height 0.21mm; width 0.24mm

Discussion: Externally *Cytheropteron tuberculatum* was compared with *Kangarina abyssicola* (Müller, G.W.) sp. in Ruggieri, 1953a. Differs in dorsal and anterior outline of valves, in alar process located in same level without pointed posterior portion, which is visible in the Ruggieri species. Furthermore, the present carapace is smooth, without punctae, presenting only furrows originated from ridge arrangement. It should be noted that the Ruggieri species due to its hinge and carapace outline does not belong to *Kangarina* but must belong to the *Cytheropteron* genus.

Occurrence: Pelotas Basin, State of Rio Grande do Sul, Brasil. Drillings of PETROBRÁS: 2-GA-1-RS, cores 36 (126,35 – 129,40m), 37 (129,40 – 132,45m), 39 (133,40 – 138,98m); 2-GA-2-RS, cores 5 (108,50 – 111,55m), 8 (117,65 – 120,70m); 2-CI-1-RS, cores 4 (405 – 408m), 5 (505 – 506m); 2-PN-1-RS core 4 (202 – 205m).

Genus *Hemicytherura* Elofson, 1941

Diagnosis: Schale ohne seitliche Flügel. Schalenoberfläche mit einem rauten oder netzformigen Muster. Innenrand und Verwachsungslinie fallen ausser dem Vorderrand zusammen. Elofson, 1941.

Prominent caudal process. Hinge of right valve consists of terminal teeth separated by a groove that is open to the interior and overlain by a flange groove. Marginal area wide. Radial pore canals tend to be grouped. Pooser, 1965.

Species typus — *Cythere cellulosa* Norman, 1865, p.22, Pl. 5, Fig. 17-20; Pl. 6, Fig. 17.

Hemicytherura howei (Puri, 1953) emend. Sanguinetti, 1979

Kangarina howei Puri, 1953

non *Hemicytherura howei* (Puri, 1953) Pooser, 1965

Plate 5, figures 1a-d; Plate 11, figures 2a-b

Holotypus: Henry Howe Collection

n. 2700, Louisiana State University

Locus typicus: Jackson Bluff, Ochlockonee River Leon County, Florida USA

Stratum typicum: Ecphora Facies (Chocatawhatchee Stage), Lower Miocene

Plesiotypi: Female — Right valve

n. MP-0-425. Left valve n. MP-0-426.

Complete carapace n. MP-0-428

Male — Left valve n. MP-0-427

Locus: Pelotas Basin, State of Rio Grande do Sul, Brasil PETROBRÁS Drilling

2-GA-1-RS, core 39 (133,40 – 138,98m)

Stratum: Subzone *Hemicytherura howei*, Zone *Henryhowella evax* (Miocene).

Description: External view — Valves unequal: right valve higher in median portion overlapping the left next to dorsal border. Right valve — Dorsal border strongly arched; small anterior border, more or less curved and acute; ventral border anteriorly concave and convex in median portion. Surface covered all over by ridges arranged from anterior to posterior border in concentric way. Of these, especially two dorsal, two ventral and one median longitudinal are visible. Ridges intercalated by well marked punctae. Median caudal process more distinct in females. Two clear depressions margining median ridge and one elongate in posteroventral portion. Carapace in dorsal view, ovoid and elongate. Sexual dimorphism present: females higher in median portion of valves with posterior border acute forming well-marked caudal process.

Internal view — Right valve — Dorsal border strongly arched. Curved hinge with well-developed groove crenulated, and crenulated lateral teeth. Wide anterior border with small vestibule. Sinuous marginal pore canals grouped, distributed all over marginal zone being more numerous in anterior border. Muscle scars not visible.

Dimensions

Plesiotype — Female

Right valve: length 0.46mm; height 0.25mm

Left valve: length 0.44mm; height 0.23mm

Complete carapace: length 0.42mm; height 0.25mm; width 0.24mm

Male

Left valve: length 0.43mm; height 0.26mm

Discussion: All the characters of *Hemicytherura howei* (Puri, 1953) are similar to those of *Kangarina howei* Puri, 1953. For this reason, the specific name was kept. But the generic name was changed because the characteristics of the Puri species are of *Hemicytherura* and not of *Kangarina* genus. The species of Puri was emended because his description and illustration are not clear enough. Furthermore, no sexual dimorphism is mentioned when a marked difference between male and female was here observed (Pl. 5, fig. 1b, 1d).

As to *Hemicytherura howei* (Puri, 1953) Pooser, 1965 shows a very different ornamentation what makes the present author think it belong to a different species.

Occurrence: Florida, USA. Pelotas Basin, State of Rio Grande do Sul, Brasil. Drillings of PETROBRÁS: 2-GA-1-RS, cores 36 (126,35 — 129,40m), 37 (129,40 — 132,45m), 38 (132,45 — 133,40m), 39 (133,40 — 138,98m); 2-GA-2-RS, core 6 (111,55 — 114,60m); 2-PN-1-RS, core 4 (202 — 205m); 2-PS-1-RS, core 5 (270 — 273m).

Família Hemicytheridae Puri, 1953

Genus *Aurila* Pokorný, 1955

Auris Neviani, 1928 (non *Auris* Spix, 1827)

Diagnosis: Hinge amphidont of the right valve anteriorly with a high entire tooth, behind which lies a socket passing into the median furrow, which is very finely taxodontly articulated, especially in the dorsal portion. Posteriorly is an elongated tooth, entire above, with a characteristic incision in the middle of the ventral portion, into which the tooth growing from the hinge socket of the opposite valve fits.

Species typus — *Cythere convexa* Baird, 1850, p.174, Pl. 21, Fig. 3.

Aurila trigonula (Jones, 1856) van den Bold, 1957

Cythere trigonula Jones, 1856

Hemicythere trigonula (Jones) Key, 1955

Plate 5, figures 2a-b; Plate 11, figure 3

Holotypus: Not mentioned by the author
Locus typicus: Crag of Suffolk, England
Stratum typicum: Pliocene
Homotypus: Complete carapace
n. MP-0-429 A, B
Locus: Pelotas Basin, State of Rio Grande
do Sul, Brasil PETROBRÁS Drilling
2-GA-2-RS, core 6 (111,55 – 114,60m)
Stratum: Subzone *Hemicytherura howei*,
Zone *Henryhowella evax* (Miocene).

Description: External view – Valves unequal. Left valve bigger than right, with overlapping along the dorsal border. Left valve oval in lateral view; anterior and dorsal borders continuous and curved; posterior border acute with small caudal process; ventral border curved. In right valve dorsal border is straight and bent backwards; caudal process distinct. Carapace surface covered by punctae presenting bigger diameter in median portion of valves. Alar process filling up three quarters of median portion of valves. Eye tubercle slightly visible and small re-entrance close to anterior cardinal angle. Sexual dimorphism not observed.

Internal view – Hinge corresponds exactly to Pokorny's description for genus, that is, in right valve one anterior tooth, socket followed by fine crenulated hinge groove and posterior tooth. Vestibule visible along all free margin. Straight marginal pore canals, widening in median portion, isolated and in great number. Muscle scars not visible.

Dimensions

Homotypus – Left valve: length 0.63mm; height 0.37mm
Right valve: length 0.63mm; height 0.34mm

Discussion: Compared with *Aurila trigonula* (Jones, 1856) van den Bold, 1957 it shows total coincidence in external morphology and carapace dimensions. Internally, all characters also in accordance with *Aurila* Pokorny, 1955. Due to these reasons, its denomination was kept and only details were added to the external description of Jones and to the internal one of Pokorny.

Occurrence: Crag Suffolk, England, Trinidad. Pelotas Basin State of Rio Grande do Sul, Brasil. Drillings of PETROBRÁS: 2-GA-1-RS cores 36 (126,35 – 129, 40m), 37 (129,40 – 132,45m), 38 (132,45 – 133,40m), 39 (133,40 – 138,98m); 2-GA-2-RS, cores 5 (108,55 – 111,55m), 6 (111,55 – 114,60m), 8 (117,65 – 120,70m), 9 (120,70 – 123,75m); 2-CI-1-RS, cores 4 (405 – 408m), 5 (505 – 506m); 2-MO-1-RS, core 7 (716 – 718m); 2-PJ-1-RS, core 2 (132,05m); 2-PS-1-RS, core 5 (270 – 273m).

Genus *Australicythere* Benson, 1964

Diagnosis: Carapace subrectangular to subquadrate in shape; surface with a somewhat irregular reticular pattern of delicate ridges and intermediate pitted excavations. There are no bold ridges except the ventrolateral ridge, possibly a vertical posterior ridge and a submarginal rim at either end. A prominent subcentral tubercle reflects an interior pit which is the locus of a multicomponent hemicytherid muscle scar pattern. The hinge is holamphidont, the duplicature is fused and contains many radial pore canals.

Australicythere bensoni Sanguinetti, sp. nov.

Plate 5, figures 3a-d; Plate 11, figures 4a-b

Derivatio nominis: In honor of Dr. Richard H. Benson of Smithsonian Institution, USA

Holotypus: Male — Complete carapace n. MP-0-430 A, B

Paratypi: Female — Complete carapace n. MP-0-431. Left valve n. MP-0-432

Locus typicus: Pelotas Basin, State of Rio Grande do Sul, Brasil PETROBRÁS Drilling 2-MO-1-RS, core 6 (716m)

Stratum typicum: Subzone *Krithe trinidadensis*, Zone *Henryhowella evax* (Miocene)

Diagnosis: Carapace subrectangular with small angular posterodorsal elevation; highly ornamented with reticula and spines.

Description: External view — Carapace in lateral view subrectangular; dorsal border irregular due to presence of spines; anterior border widely rounded, finely denticulated and traversed by a well — developed and undulated rim; ventral border slightly oblique, posterior border reticulated and thinner than anterior. Ridge laminar and oblique, with ventromedian position, filling up two thirds of valve length; small angular elevation in posterodorsal portion coinciding with the height of ventral ridge end. Valve afterwards suffers reduction towards posterior border. Subcentrally there is an irregular tubercle corresponding to the position of the muscle scars. Eye tubercle prominent followed by slight re-entrance. Carapace surface reticulated with small spines in the edges of reticula. Sexual dimorphism present; males with more elongated carapace.

Internal view — Right valve — Dorsal border irregular. Hinge straight with anterior tooth socket, fine crenulated hinge groove and posterior tooth lobated. Small vestibule along marginal zone, radial pore canals, with median widening, more numerous in anterior border. Anteromedian depression corresponds to the characteristic muscle scars of the genus, that is of the multicomposed type. They are visible in greater number in left valve.

Dimensions

Holotypus — Male

Left valve: length 0.73mm; height 0.40mm

Right valve: length 0.73mm; height 0.39mm

Paratypi — Female

Complete carapace: length 0.70mm; height 0.42mm; width 0.35mm

Left valve: length 0.70mm; height 0.41mm

Discussion: The specimens were classified as *Australicythere* which, for the time being, constitute an exclusively Recent genus with only two species described and, for this reason, according to its author, does not have its characteristics well defined yet. It differs from *Australicythere polylyca* (Müller, 1908) Benson, 1964 in the following aspects: does not present posterior ridge but a small posterodorsal elevation; surface is heavily ornamented and furthermore, the specimens are smaller. Males, like in Benson's species, are longer and thinner than females.

Occurrence: Pelotas Basin, State of Rio Grande do Sul, Brasil. Drillings of PETROBRÁS: 2-CI-1-RS, cores 4 (405 – 408m), 5 (505 – 506m); 2-MO-1-RS, cores 5 (506m), 7 (716m); 2-PS-1-RS, core 6 (320 – 322m); 2-GA-1-RS, cores 36 (126,35 – 129,40m), 37 (129,40 – 132,35m); 2-PJ-1-RS, core 2 (132,05m).

Genus *Caudites* Coryell et Fields, 1937

Diagnosis: Carapace small, thick-shelled, translucent, subtriangular in lateral view, a thickened marginal rim and a ventral posterior caudal projection. Hingement structure in right valve consists of a high anterior knob-like tooth behind which is a deep socket which becomes narrower and shallower posteriorly, trending obliquely toward the dorsal margin near the midpoint of the hinge where the shallow socket disappears; a narrow groove continues backward parallel and below the dorsal margin to the posterior cardinal angle. The socket and narrow groove are both pitted. The dorsal margin is slightly flanged. In the posterior cardinal angle the dorsal margin is occupied by a large, flat and triangular tooth extending for some distance down the posterior slope. The hingement of the left valve is a complement of the right. A large eye spot is present anterior to and below the anterior dentition. The inner marginal area and radial pore canals are present.

Species typus — *Caudites medialis* Coryell et Fields, 1937, p.10-11, Fig. 12 a-d.

Caudites diagonalis Sanguinetti, sp. nov.

Plate 5, figures 4 a-c; Plate 11, figures 5 a-b

Derivatio nominis: Due to the presence of a well – developed diagonal ridge

Holotypus: Complete carapace
n. MP-0-433 A, B

Locus typicus: Pelotas Basin, State of Rio Grande do Sul, Brasil PETROBRÁS Drilling 2-GA-2-RS, core 6 (111,15 – 114,60m)

Stratum typicum: Subzone *Hemicytherura howei*, Zone *Henryhowella evax* (Miocene).

Diagnosis: Central ridge diagonally, and ventral well-developed with a V-shape figure in anterior portion.

Description: External view — Carapace in lateral view subtriangular, elongated and compressed. Dorsal border slightly sinuous, anterior border widely rounded; ventral border slightly re-entrant in median portion, posterior border with posteroventral caudal process. Eye tubercle small and prominent. Anterior border traversed by a well-developed rim smoothly continuing throughout ventral and posterior borders. Carapace surface smooth with ridges. Interlinked ridges: the ventral begins near anteroventral border, sinuous, extends until posteroventral border, continues parallel to posterior border forms small elevation near posterodorsal border where it begins to split: one part sinuous, near dorsal border, runs forward filling up one-third of valve length; the other part, diagonally goes up to central re-entrance, where it interrupts and moves again up to anteroventral border. From the central re-entrance another ridge, less prominent, continues up to anterior border, forming a V with the anterior portion of diagonal ridge. Scattered normal pore canals are externally visible. Median circular re-entrance corresponding to muscle scar position. Sexual dimorphism not observed.

Internal view — Left valve — Sinuous dorsal border. Hinge also sinuous and inclined backwards, formed by an anterior socket followed by a single tooth with widened base, bar and posterior socket located in posterodorsal angle. In right valve the anterior tooth is pointed and the posterior triangular. Small vestibule along marginal zone. Marginal pore canals in great number, widened in median position. Muscle scars apparently six in number, but impossible to be observed with precision.

Dimensions

Holotypus — Left valve: length 0.63mm; height 0.32mm

Right valve: length 0.63mm; height 0.32mm

Discussion: It was compared with *Caudites medialis* Coryell et Fields, 1937, *C. sellardsi* (Howe et Neill, 1935) Puri, 1953 and *C. obliquecostatus* van den Bold, 1963. Internal characters coincide. Externally is more similar to *C. obliquecostatus*. However, it differs in that it presents a well-developed ventral ridge; one dorsal, short but also developed; and one anterior, from the central onwards, equally distinct forming diagonally a V-shape figure with the anterior part of ridge.

Occurrence: Pelotas Basin, State of Rio Grande do Sul, Brasil Drillings of PETROBRÁS: 2-PN-1-RS, core 4 (202 — 205m); 2-PS-1-RS, core 6 (320 — 322m); 2-GA-1-RS, cores 34 (120, 25 — 123,30m), 35 (123,30 — 126,35m), 36 (126,35 — 129,40m); 2-GA-2-RS, core 6 (111,55 — 114,60m).

Família Leptocytheridae Hanai, 1957

Genus *Callistocythere* Ruggieri, 1953

Diagnosis: Carapaci visti di lato subrettangolari-reniformi, solo eccezionalmente molto allungati. Superficie generalmente, fortemente ornamentata, con cordoni, gibbosità, punteggiature, ecc.; generalmente é evidente nell'area anteriore un solco che la incide obliquamente partendo dalla regione oculare a terminando nell'angolo anteroinferiore. I poriccanali marginali anteriori sono in numero scarso, diseguali fra loro: fra l'uno e l'altro il margine interno e la linea di fusione coincidono.

Species typus — *Cythere littoralis* Müller, 1894, p.544, Taf. 28, Fig. 18 (of the translation to English language).

Callistocythere litoralensis (Rossi de Garcia, 1966) Sanguinetti, 1979

Perissocytheridea litoralensis Rossi de Garcia, 1966

Plate 6, figures 1a-d e 2a-b; Plate 12, figures 1a-b

Holotypus: CM 27, Departamento de Paleontología, Instituto Nacional de Geología y Minería, Buenos Aires, Argentina

Locus typicus: Cantera Municipal, Victoria, Provincia de Entre Ríos, Argentina

Stratum typicum: Formación Entre Ríos, Miocene

Plesiotypi: Female — Left valve

n. MP-0-434. Right valve n. MP-0-435

Male — Complete carapace n. MP-0-436

Locus: Pelotas Basin, State of Rio Grande do Sul, Brasil. PETROBRÁS Drilling 2-PN-1-RS, core 4 (202 — 205m)

Stratum: Subzone *Hemicytherura howei*
Zone *Henryhowella evax* (Miocene)

Diagnosis: Carapace surface with small ridges, arranged disorderly giving it a wrinkled aspect.

Description: External view — Carapace in lateral view subrectangular, ovoid, higher close to anterior cardinal angle. Valves unequal: left, higher than right. Left valve with dorsal border curved and narrowing backwards; ventral border more or less straight; anterior border widely rounded and posterior rounded but narrower in right valve. Carapace slightly inflated. Carapace surface covered by small ridges giving it a wrinkled aspect. Sexual dimorphism present: males smaller in size with dorsal border straight and inclined.

Internal view — Left valve — Dorsal border sinuous. Hinge straight and bent backwards presenting one anterior groove followed by two denticles, hinge groove crenulated, two denticles and posterior socket. Right valve presents complementary elements, only the two small posterior sockets are not distinct. Wide marginal zone, mainly in anterior border. Vestibule in anterior marginal zone. Marginal pore canals in small number, sinuous and arched, sometimes bifurcated. Normal pore canals scattered. Only three muscle scars are visible in left valve.

Dimensions

Plesiotypi — Female

Left valve: length 0.40mm; height 0.24mm

Right valve: length 0.40mm; height 0.23mm

Male

Complete carapace: length 0.38mm; height 0.21mm; width 0.17mm

Discussion: Comparison was made with type material of *Perissocytheridea litoralensis* Rossi de Garcia, 1966. Total coincidence of external and internal morphological characters was then evidenced. Similarity in size also exists since the specimens of *P. litoralensis* of type material are 0.38mm long, although those registered by Rossi de Garcia are 0.27 long. For these reasons the specific name was kept. On the other hand the generic name was changed because the characteristics of *P. litoralensis* correspond to those of *Callistocythere*.

Occurrence: Cantera Municipal, Victoria Provincia de Entre Rios, Argentina. Pelotas Basin, State of Rio Grande do Sul, Brasil. Drillings of PETROBRÁS: 2-CI-1-RS, cores 4 (405 – 408m), 5 (505 – 506m); 2-GA-1-RS, cores 37 (129,40 – 132,45m), 39 (133,40 – 138,98m); 2-GA-2-RS, cores 5 (108,50 – 111,55m), 6 (111,55 – 114,60m), 8 (117,65 – 120,70m); 2-PN-1-RS, core 4 (202 – 205m); 2-PS-1-RS, cores 5 (270 – 273m), 6 (320 – 322m); 2-MO-1-RS, core 7 (716m); 2-PJ-1-RS, core 2 (132,05m).

Família Paradoxostomatidae Brady et Norman, 1889
Sub Família Cytheromatinae Elofson, 1939

Genus *Pellucistoma* Coryell et Fields, 1937

Diagnosis: Carapace small, translucent, subovate, finely perforated surface, with a subdorsal posterior caudal projection; dorsal hinge line straight; anterior end obliquely and broadly curved. The marginal area well developed, with few radial pore canals. The hingement of the left valve consists of an anterior long blade-like triangular tooth, from which a long serrated bar extends backwards and terminates at the posterior cardinal angle; above this bar and parallel to it is a narrow incised linelike groove. The hinge structure of the left valve fits into an anterior socket and crenulated groove of the right valve; the socket is formed by a tooth-like structure projecting from the inner surface just below the anterior cardinal angle, leaving the cavity open anteriorly and posteriorly; the posterior cardinal area of the right valve is somewhat angulated by the development, over the dorsal margin, of a sharp, small hook which receives the posterior end of the bar of the left valve. The valves are apparently equal except in the mid-ventral margin where the valves are rabbeted. A muscle scar pattern is distinguishable.

Species typus – *Pellucistoma howei* Coryell et Fields, 1937, p. 17-18, Fig. 18a-c.

Pellucistoma gibosa Sanguinetti, sp. nov.

Plate 6, figures 3a-c; Plate 12, figures 2a-c

Derivatio nominis: Due to presence of a gibbosity in the right valve

Holotypus: Right valve n. MP-0-437

Paratypes: Left valve n. MP-0-438. Complete carapace n. MP-0-439

Locus typicus: Pelotas Basin, State of Rio Grande do Sul, Brasil PETROBRÁS Drilling 2-PN-1-RS, core 4 (202 – 205m)

Stratum typicum: Subzone *Hemicytherura howei*, Zone *Henryhowella evax* (Miocene)

Diagnosis: Gibbosity in dorsomedian portion of right valve. Dorsal border straight and bent backwards. Caudal process ventromedian.

Description: External view — Carapace in lateral view presents losangular form, sub-elongate, being higher in anterior third and from this point on the straight dorsal border inclines backwards acutely ending up in a pointed caudal process, ventromedian; anterior border elongated and obliquely rounded; ventral border strongly convex, ending in caudal process. Carapace surface smooth with normal pore canals, scattered. Valves unequal: right valve standing out in relation to left along dorsal border and left valve slightly bigger than right in ventral border. Right valve in its dorsomedian portion presents a peculiar gibbosity. Carapace in dorsal view fusiform with lateral projection. Sexual dimorphism not observed.

Internal view — Left valve — Dorsal border straight, strongly bent backwards. Hinge also inclined with a strong anterior tooth, with wide base and rounded apex followed by elongated bar, slightly serrulated, posterior tooth slightly distinct and elongated. Wide marginal zone, more in anterior than in posterior border and crossed by simple or bifurcate pore canals. Four muscle scars vertically arranged; and one anterior in U-shape, with opening pointed forwards.

Dimensions

Holotypus — Right valve: length: 0.51mm; height 0.23mm

Paratypi — Left valve: length 0.51mm; height 0.23mm

Complete carapace: length 0.57mm; height 0.27mm; width 0.21mm

Discussion: It is similar to *Pellucistoma spurium* van den Bold, 1963. Differs in the outline of valves since present form has straight dorsal border bent backwards and caudal process ventromedian. Differs also, as well as the other species of *Pellucistoma*, due to the presence of acute gibbosity in dorsomedian portion of right valve.

Occurrence: Pelotas Basin, State of Rio Grande do Sul, Brasil Drillings of PETROBRÁS: 2-GA-1-RS, cores 36 (126,35 — 129,40m), 39 (133,40 — 138,98m); 2-GA-2-RS, core 8 (117,65 — 120,70m); 2-PN-1-RS, core 4 (202 — 205m); 2-PS-1-RS, core 5 (270 — 273m).

Família Pectocytheridae Hanai, 1957

Genus *Munseyella* van den Bold, 1957

Toulminia Munsey, 1953 (non *Toulminia* Zittel, 1878)

Diagnosis: Carapace small, compressed, quadrangular to subromboidal, higher near anterodorsal angle, thicker slightly posterior to middle. Dorsal margin straight; anterior obliquely rounded; ventral sinuate, converging posteriorly towards the dorsal margin; posterior straight nearly at right angle to dorsal margin. Anterior and posterior edges may carry short, indistinct teeth. Surface heavily ornamented.

Hinge of right valve consists of small ovate anterior and posterior teeth, connected by a minutely crenulate groove. Immediately behind the anterior tooth, and in front of the posterior tooth, the dorsal groove widens, forming small, shallow, ovalshaped sockets. Hinge in left valve consists of small anterior and posterior sockets, connected by a narrow dorsal bar. Just anterior to the posterior socket, the bar swells into a low, elongate tooth; the tooth posterior to the anterior socket is shorter and more narrow than the posterior.

Inner margin coincides with the line of concrescence except at the anterior and posterior ends, being broader at the anterior, and deviating only slightly from the line of concrescence at the posterior. Radial pore canals indistinct. The muscle scar is largely obscured by surface ornamentation, but appears to consist of four small, vertically aligned scars, anterior to which is a larger element with

a more questionable one dorsal to this. Female differs from male in being less elongate, slightly less compressed, and in having a gently arched dorsal margin.

Species typus — *Toulminia hyalokystis* Munsey, 1953 p.6-7, Pl. 2, Fig. 26-27, Text-fig. 1.

Munseyella punctata van den Bold, 1958

Plate 7, figures 1a-e

Holotypus: Complete carapace, U.S. Nat. Mus. n. 562346

Locus typicus: Caparo River, Brasso village, near the junction of the roads Brasso-Tamana and Caparo Valley, Trinidad

Stratum typicum: Brasso Formation (*Globorotalia fohsi* sensu lato), Miocene

Homotypi: Female — Right valve n. MP-0-441 Left valve n. MP-0-440 Complete carapace n. MP-0-443

Male — Complete carapace n. MP-0-442

Locus: Pelotas Basin, State of Rio Grande do Sul, Brasil. PETROBRÁS Drilling 2-CI-1-RS, core 4 (405 — 408m)

Stratum: Subzone *Krithe trinidadensis*, Zone *Henryhowella evax* (Miocene)

Description: External view — Carapace in lateral view elongate, higher close to the anterior cardinal angle. Dorsal border straight bent backwards; anterior border rounded and crossed by rim; ventral border almost straight, posterior truncated presenting two small tubercles. Carapace surface punctated; punctae disorderly or linearly arranged. Valves in anterior border are excavated right after rim and following it. Sexual dimorphism present: males more elongated than females.

Internal view — Right valve — Dorsal border straight and bent backwards. Hinge also straight and inclined presenting an anterior triangular tooth followed by socket and crenulated hinge groove and ending with a tooth located right under the posterior cardinal angle. Only a few marginal pore canals are visible.

Dimensions

Homotypi — Female

Right valve: length 0.36mm; height 0.19mm

Left valve: length 0.36mm; height 0.19mm

Complete carapace: length 0.36mm; height 0.19mm; width 0.13mm

Male

Complete carapace: length 0.36mm; height 0.17mm; width 0.15mm

Discussion: The comparison was made with *Munseyella punctata* van den Bold, 1958, through type material. Sexual dimorphism was here observed, but not yet registered for the *Munseyella* genus.

Occurrence: Trinidad. Pelotas Basin, State of Rio Grande do Sul, Brasil PETROBRÁS Drillings 2-CI-1-RS, cores 4 (405 — 408m), 5 (505 — 506m); 2-CA-1-RS, core 50 (248,70 — 254,80m); 2-MO-1-RS, core 9 (926,50 — 927,50m).

Derivatio nominis: In honor of Dr. W. A. van den Bold, Louisiana State University, USA

Holotypus: Female — Complete carapace n. MP-0-444 A, B

Paratypi: Male — Right valve n. MP-0-445
Female — Complete carapace n. MP-0-446

Locus typicus: Pelotas Basin, State of Rio Grande do Sul, Brasil Drilling of PETROBRÁS: 2-GA-1-RS, core 37 (129,40 — 132,45m)

Stratum typicum: Subzone *Hemicytherura howei*, Zone *Henryhowella evax* (Miocene).

Diagnosis: Anterior border without rim and posterior border acute. Carapace surface strongly punctated.

Description: External view — Carapace in lateral view ovoid and elongate more higher in median portion of valve. Dorsal border inclining towards anterior and posterior borders. Anterior border obliquely rounded; ventral border convex in median portion. Posterior border acute presenting two tubercles. Left valve bigger than right. Carapace inflated and with surface highly punctated; punctae arranged in a rather irregular form, except in borders where they are in rows. Sexual dimorphism present: females more inflated and higher in median portion.

Internal view — Right valve — Dorsal border sinuous. Straight hinge and bent backwards presenting one sharp anterior tooth, followed by socket and hinge groove ending with an elongate tooth, located in the posterior cardinal angle. Anterior marginal zone wide, with small vestibule. Few marginal pore canals, straight and wide, which are distributed in the marginal zone. Muscle scars not visible.

Dimensions

Holotypus — Female

Left valve: length 0.38mm; height 0.22mm

Right valve: length 0.37mm; height 0.22mm

Paratypi — Male

Right valve: length 0.38mm; height 0.22mm

Female

Complete carapace: length 0.37mm; height 0.22mm; width 0.16mm

Discussion: It is similar to *Munseyella punctata* van den Bold, 1958 differing in the following aspects: carapace ovoid-elongate, higher in median portion of valves; anterior border without rim and posterior border acute. Carapace surface strongly punctated.

Occurrence: Pelotas Basin, State of Rio Grande do Sul, Brasil Drillings of PETROBRÁS: 2-GA-1-RS, cores 36 (126,35 — 129,40m), 37 (129,40 — 132,45m), 39 (133,40 — 138,98m); 2-GA-2-RS, cores 5 (108,50 — 111,55m), 6 (111,55 — 114,60m); 2-PN-1-RS core 4 (202 — 205m).

Diagnosis: Carapace subquadrate to subrhomboidal, left valve overlapping right at anterodorsal angle, medium sized to large; ventrolateral keels prominent; shell smooth or ornamented with a network of ribs, sometimes with small tubercles; dorsal margin broadly rounded, denticulate. No caudal process. Subcentral tubercle usually prominent, radial pore canals numerous with median swellings; muscle scars in a deep depression: four posterior and two anterior. Selvage and peripheral flange strong, line of concrescence and inner margin coinciding, duplicatures broad. Hinge: right valve with a simple terminal anterior tooth (sitting on an elevated base) and postadjacent socket, a terminal posterior tooth, sometimes distinctly denticulate, often obscurely denticulate or lobed; long, straight, crenulate, median groove above the terminal teeth, Left valve complementary with anterior tooth simple. Sexes distinct.

Species typus — *Cythere arata* Brady, 1880, p.101, Pl. XXIV, Fig. 2a-c.

Bradleya rheingantz Sanguinetti, sp. nov.

Plate 6, figures 4a-c; Plate 12, figures 4a-b

Derivatio nominis: In honor of Mr. Curt C. Theingantz of Pelotas city, State of Rio Grande do Sul, Brasil

Holotypus: Left valve n. MP-0-447.

Paratypi: Right valve n. MP-0-448. Complete carapace n. MP-0-449.

Locus typicus: Pelotas Basin, State of Rio Grande do Sul, Brasil PETROBRÁS Drilling 2-MO-1-RS, core 7 (716 – 718m)

Stratum typicum: Subzone *Krithe trinidensis*, Zone *Henryhowella evax* (Miocene)

Diagnosis: Valves unequal. Carapace subrhomboid with posterior border narrower; reticulated surface with light central node.

Description: External view — Dorsal border sinuous; anterior border obliquely rounded and denticulated. Convex ventral border in median portion, converging strongly to posterior border and forming with it a concavity which is narrower and denticulated. Valve inflated in median portion with low-lying close to posterior border. Surface strongly reticulated, originating from ridges more or less quadrangular which are joined; simple and scattered pore canals can be observed close to these ridges. Transversal rim close to anterior border continues ventrally and changes into an alar process which is sharp in posteromedian portion converging afterwards to posterior border where it disappears. Dorsally it presents a sinuous rim which begins close to posterodorsal angle and ends close to median part of anterior transversal rim. Left valve bigger than right. Sexual dimorphism not observed; however, carapaces are inflated, possibly the females.

Internal view — Left valve — Dorsal border irregular. Hinge straight with socket followed by elevated tooth with wider base; bar finely crenulated and posterior socket elongate and simple. Marginal zone with straight or curve pore canals simple and scattered. Small vestibule in anterior border. Four muscle scars arranged in rows and two anterior and small, visible only in right valve.

Dimensions.

Holotypus — Left valve: length 0.83mm; height 0.47mm

Paratypes — Right valve: length 0.81mm; height 0.44mm
Complete carapace: length 0.75mm; height 0.39mm; width 0.31mm

Discussion: Brady, 1880 (Pl. 24, Fig. 1a-y) describes *Cythere dictyon* saying that he doubts the specimens shown in Fig. 1j, 1v-y belong to that species. The present species comes very close to the forms shown in Fig. 1j and 1v-y with which the comparison was made. Left valve of the present species is similar to the one shown in Fig. 1j, by Brady but it is not equal, differing in the following aspects: posterior portion more acute without transversal elevation visible in Brady's form and lowering of posterior portion of valve being smoother. Brady's form also does not present anteromedian node which corresponds to the position of muscle scars.

Occurrence: Pelotas Basin, State of Rio Grande do Sul, Brasil. PETROBRÁS Drillings: 2-GA-1-RS, cores 36 (126,35 – 129,40m), 37 (129,40 – 132,45m), 38 (132,45 – 133,40m), 39 (133,40 – 138,98m); 2-MO-1-RS, cores 5 (506 – 508m), 6 (611m), 7 (716 – 718m), 12 (1.185,50 – 1.185,90m), 16 (1.460,10 – 1.462,30m); 2-CI-1-RS, core 4 (405 – 408m); 2-CA-1-RS, core 50 (248,70 – 254,80m); 2-PJ-1-RS, core 2 (132,05).

Genus *Henryhowella* Puri, 1957

Howella Puri, 1956 (non *Howella* Ogilby, 1899)

Diagnosis: Carapace subrectangular, subangular posteriorly, subovate in side view. Anterior end broadly rounded, denticulate, with well-developed marginal rim, posterior end subangular to obliquely rounded. Dorsal margin more or less straight, ventral margin concave in the middle. Surface of the carapace in the anterior half ornamented with small, rounded spines arranged concentrically; posterior half with three well-developed rows of echinose spines. Central tubercle well-developed with a cluster of short stubby spines. Marginal area broad, marginal pore canals numerous, long and straight, more in the anterior margin than in the posterior and ventral margins. Hinge of right valve with an anterior crenulate tooth with three lobes, a postadjacent socket and a posterior knob-like large tooth connected with a groove. Hinge of the left valve complementary.

Species typus — *Cythere evax* Ulrich et Bassler, 1940. p.119, Pl. XXXVI, Fig.6-8.

Henryhowella evax (Ulrich et Bassler, 1904) Puri, 1957

Cythere evax Ulrich et Bassler, 1904

Cythere evax oblongula Ulrich et Bassler, 1904

Trachyleberis evax (Ulrich et Bassler, 1904) Swain, 1951

Echinocythereis evax (Ulrich et Bassler, 1904) Puri, 1953

Plate 8, figures 1a-b; Plate 13, figures 1a-b

Holotypus: Not indicated. Type material deposited in the U.S. National Museum and Maryland Geological Survey

Locus Typicus: Plum Point, Maryland, USA

Stratum typicum: Calvert Formation, Chesapeake Group, Miocene

Homotypi: Male — Left valve n. MP-0-462. Right valve n. MP-0-463. Complete carapace n. MP-0-464. Right valve n. MP-0-465

Female — Left valve n. MP-0-466. Right valve n. MP-0-467. Complete carapace n. MP-0-468

Locus: Pelotas Basin, State of Rio Grande do Sul, Brasil. PETROBRÁS Drilling 2-CI-1-RS, core 4 (405 — 408m)

Stratum: Subzone *Krithe trinidadensis*, Zone *Henryhowella evax* (Miocene).

Description: External view — Carapace in lateral view subquadrangular, higher close to anterior cardinal angle. Sinuous dorsal border. Anterior border widely rounded and run through by small spines. Ventral border sinuous narrowing backwards, posterior border almost straight and narrower than anterior. Surface covered by small sharp spines which are arranged concentrically close to anterior border. In anteromedian portion, centrally a rounded node, with spines also. Salient eye tubercle. Sexual dimorphism present: females are smaller. In dorsal view: male ovoid-elongate and female ovoid.

Internal view — Left valve — Dorsal border straight and denticulated. Hinge straight with anterior socket followed by triangular tooth, finely crenulated hinge groove and posterior socket. Marginal zone with long, straight and sinuous pore canals, at times presenting anastomosed. Small vestibule in anterior border. Normal pore canals scattered. Cavity corresponding to muscle scars; only three are visible in right valve.

Dimensions

Homotypi — Male

Left valve: length 0.92mm; height 0.48mm

Right valve: length 0.92mm; height 0.48mm

Complete carapace: length 0.94mm; height 0.49mm; width 0.42mm

Right valve: length 0.89mm; height 0.50mm

Female

Left valve: length 0.78mm; height 0.44mm

Right valve: length 0.78mm; height 0.43mm

Complete carapace: length 0.81mm; height 0.47mm; width 0.39mm

Discussion: The specimens here studied present the characteristics of *Cythere evax*, for this reason the species name was maintained. *Cythere evax* and *Cythere evax oblongula* are considered as being female and male respectively, and of the same species as *Cythere evax* Ulrich et Bassler, 1904.

Cythere evax as *Trachyleberis evax* Swain, 1951 and *Echinocythereis evax* Puri, 1953 are considered synonymous for *Henryhowella evax* Puri, 1957.

In the figure if, Plate 8, of the present paper, is represented one specimen that has external characteristics a little different from the typical forms of *Henryhowella evax*.

Occurrence: Plum Point, Maryland; Cabo Hatteras, North Carolina, Florida, USA. Pelotas Basin, State of Rio Grande do Sul, Brasil. PETROBRÁS Drillings: 2-GA-1-RS, cores 36 (126,35 — 129,40m), 37 (129,40 — 132,45m), 39 (133,40 — 138,98m); 2-GA-2-RS, cores 6 (111,15 — 114,60m), 8 (117,65 —

120,70m), 9 (120,70 – 123,73m); 2-CI-1-RS, cores 4 (405 – 408m), 5 (505 – 506m); 2-PN-1-RS, core 4 (202 – 205m); 2-CA-1-RS, core 50 (248,70 – 254,80m); 2-PS-1-RS, core 5 (270 – 273m); 2-PJ-1-RS, core 2 (132,05m).

Genus *Orionina* Puri, 1953

Diagnosis: Carapace large elongate, valves unequal, left valve usually slightly larger than right. Anterior margin evenly rounded, somewhat flattened dorsally. Surface of the carapace reticulate with two to four well-developed longitudinal ridges. Inner margin parallel to the margin of the carapace. The line of concrescence either coincides with the inner margin entirely or slightly separated from the inner margin at the anterior margin. Marginal pore canals numerous, closely set along the anterior margin and posterior part of the ventral margin. Hinge of the right valve with an anterior lobate tooth, a post-jacent socket and posterior terminal tooth, of the left valve with an anterior lobate tooth, an adjacent socket and a posterior socket. Between the hinge elements, in the left valve, there is a well-developed ridge which fits into a corresponding furrow in the right valve.

Species typus – *Cythere vauhani* Ulrich et Bassler, 1904 p.109-110, Pl. 38, fig. 25-27.

Orionina vauhani (Ulrich et Bassler, 1904) Puri, 1953

Cythere vauhani Ulrich et Bassler, 1904

Cythereis vauhani Howe et alii, 1935

Cythereis vauhani Coryell et Fields, 1937

Cythereis vauhani Edwards, 1944

Cythereis vauhani van den Bold, 1946

Cythereis vauhani van den Bold, 1950

Trachyleberis vauhani Swain, 1951

Plate 6, figures 5a-c; Plate 13, figures 2a-b

Holotypus: Not indicated. Type material deposited in the U.S. National Museum and Maryland Geological Survey
Locus typicus: James River, Virginia, USA

Stratum typicum: Chesapeake Group,
Miocene
Homotypi: Female (?)
Complete carapace n. MP-0-450 A, B
Male (?)
Right valve n. MP-0-451
Locus: Pelotas Basin, State of Rio Grande
do Sul, Brasil PETROBRÁS Drilling
2-GA-1-RS, core 39 (133,40 – 138,98m)
Stratum: Subzone *Hemicytherura howei*,
Zone *Henryhowella evax* (Miocene).

Description: Carapace in lateral view subquadrangular. Dorsal border curved bent backwards; anterior border obliquely rounded; ventral border re-entering in anteromedian portion; posterior border straight in superior part with a slight extension in inferior part. Anterior and ventral borders and inferior part of posterior border finely crenulated. Carapace surface ornamented. From the tubercle onwards anterior border, there is a rim. Longitudinally there are three ridges the first, dorsal, is small and stretches out from the tubercle to the back, ending close to posterior cardinal angle where it joins the median ridge which is longer and stretches out since this point up to the rim of anterior border; ventral ridge stretches out since posterior border and in median portion of valve bifurcates and becomes one again, close to the rim of anterior border. These ridges are interlinked by small and fine processes which give a mesh aspect to carapace. Eye tubercle present. Presence of sexual dimorphism impossible to be determined due to the small number of specimens. Among them only one right valve (Pl. 6, Fig. 5c) is really longer and narrower, looking like a male. In this case, the valves represented in Pl. 6, fig. 5a-b would be of a female.

Internal view – Right valve – Dorsal border curved and bent backwards with elevation close to posterodorsal angle. Hinge straight and bent backwards, presenting a small sharp tooth in anterior portion, followed by an elongate socket, hinge groove and ending with a lobe tooth. Marginal zone traversed by straight pore canals with widening in median portion and more numerous in anterior border. Tiny vestibule along marginal zone. Number and arrangement of muscle scars impossible to be determined since only two are visible in left valve and three in right valve.

Dimensions

Homotypi – Female (?)

Right valve: length 0.71mm; height 0.37mm

Left valve: length 0.71mm; height 0.36mm

Male (?)

Right valve: length 0.79mm; height 0.37mm

Discussion: It was determined as *Orionina vaughani* because the only difference refers to form of anterior tooth in hinge of right valve that Puri, 1953a refers as being lobed and which is here clearly sharp. Sexual dimorphism is not pointed out for the genus and it is kept here with doubts because the small number of specimens does not allow a precise evidence.

Occurrence: Virginia, Florida; Duplin, North Carolina; USA; Cativa, Panamá; Cuba; Guatemala; Maracaibo Basin, Venezuela. Pelotas Basin, State of Rio Grande do Sul, Brasil. PETROBRÁS Drillings: 2-GA-1-RS, cores 37 (129,40 – 132,45m), 39 (133,40 – 138,98m).

Genus *Quadracythere* Hornibrook, 1952

Diagnosis: Carapace subquadrate to subovate, large to medium size, left valve overlapping right at anterodorsal angle, shell thick and heavy, ornamented with a network of ribs; margins with small spines;

ventrolateral margin of each valve produced as a prominent keel; dorsolateral margin usually with a distinct keel, posterior margin produced as a distinct caudal process; muscle scars in a depression, four posterior scars and two anterior scars, usually with two scars above; normal pore canals scattered, inconspicuous; radial canals with median swellings, numerous around the lower anterior margin and caudal process; selvage strong; peripheral flange distinct; line of concrescence coinciding with inner margin. Hinge: right valve with a stout, simple anterior tooth on an elevated base and a postjacent deep socket; a stout, smooth posterior tooth obscurely lobed; a deep short distinctly crenulate median groove above the terminal teeth; left valve complementary. Sexes distinct.

Species typus — *Cythere truncula* Brady, 1898, p.444, Pl. 47, fig. 16-17.

Quadracythere nealei Sanguinetti, sp. nov.

Plate 7, figures 3a-f; Plate 13, figures 3a-d

Derivatio nominis: In honor of Dr. John Neale of University of Hull, England

Holotypus: Male — Complete carapace
n. MP-0-460 A, B

Paratypus: Female — Complete carapace
n. MP-0-461 A, B

Locus typicus: Pelotas Basin, State of Rio Grande do Sul, Brasil PETROBRÁS Drilling: 2-PN-1-RS, core 4 (202 — 205m)

Stratum typicum: Subzone *Hemicytherura howei*, Zone *Henryhowella evax* (Miocene).

Diagnosis: Carapace subquadrangular; surface with distinct elongate or rounded punctae. Oblique alar process.

Description: External view — Carapace in lateral view subquadrangular with dorsal border sinuous. Anterior border obliquely rounded traversed by a rim; posterior border indented with median sharpening forming caudal process. Left valve slightly bigger than right. Eye tubercle present. Surface traversed by three ridges: one dorsal that originates right behind eye tubercle and continues obliquely till it reaches dorsal border, where it forms a small elevation of valve and extends until central portion ending near the median elevation of valve. Second ridge, median in longitudinal view extends out since anterior border, where it is more developed, passes by the elevation of median portion of valve and ends in posterior border. The third ridge, ventral, originates close to anterior border extends out obliquely, goes over ventral border ending in alar process in third ventromedian of the valve. Carapace surface sculptured with elongate or circular punctae, deep, intercalated by small sinuous ridges. Sexual dimorphism present: males more thinner and bigger than females.

Internal view — Right valve — Dorsal border slightly sinuous. Hinge straight formed by a simple anterior tooth, elevated with wide base, followed by socket, hinge groove crenulated, ending in a lobed tooth slightly crenulated. Marginal zone with simple pore canals, straight or sinuous scattered all over anterior border and in small number in posteroventral portion. Scattered normal pore canals. Four muscle scars arranged in row and two anterior.

Dimensions

Holotypus — Male

Left valve: length 0.69mm; height 0.38mm

Right valve: length 0.68mm; height 0.37mm

Paratypus — Female

Left valve: length 0.65mm; height 0.38mm

Right valve: length 0.65mm; height 0.37mm

Discussion: It was compared with *Quadracythere truncula* (Brady, 1898) Hornibrook, 1952. Differs in the following aspects: thinner sculpture and less geometrical disposition, median ridge more developed. Oblique alar process only covering posterior part of ventral border.

Occurrence: Pelotas Basin, State of Rio Grande do Sul, Brasil. PETROBRÁS Drillings: 2-GA-1-RS, cores 36 (126,35 - 129,40m), 37 (129,40 - 132,45m), 38 (132,45 - 133,40m), 39 (133,40 - 138,98m); 2-PN-1-RS, core 4 (202 - 205m); 2-PS-1-RS, core 6 (320 - 322m).

Família Xestoleberididae Sars, 1928

Genus *Xestoleberis* Sars, 1865

Diagnosis: Valvulae testae laevissimae, nitidissimae, tuberculis modo singulis minimis ornatae, antice quam postice multo humiliores, parte postica in femina valve inflata. Linea cardinales maxime flexuosa et ex parte subtiliter dentata; margo ventralis ultriusque valvulae ante medium intus prominens. Antennae superiores 6 articulatae, articulis ultimis 4 versus apicem sensim magnitudine decrescentibus setisque brevibus simplicibusque et antice et postice obsitis; inferiores breves 4 articulatae, flagello longo. Palpus mandibularis distincte 4 articulatus, appendice branchiali parva setis modo 2 obsita. Maxillae fere ut in genere antecedente. Pedes parvi et breves. Lobi postabdominales pilis 2 instructi. Oculi discreti. Ova et embryones sub testa feminae portantur.

Species typus — *Cythere nitida* Lilljeborg, 1853, p.169, Tab. 19, Fig. 6-7.

Xestoleberis sp.

Plate 8, figures 2a-c

Hypotypi: Left valve n. MP-0-452. Right valve n. MP-0-453. Complete carapace n. MP-0-454

Locus: Pelotas Basin, State of Rio Grande do Sul, Brasil. PETROBRÁS Drilling:

2-GA-2-RS, core 6 (111,55 – 114,60m)
Stratum: Subzone *Hemicytherura howei*,
Zone *Henryhowella evax* (Miocene).

Description: External view — Carapace in lateral view, higher in median portion. Valves inflated. Dorsal border descending towards anterior and posterior borders, which are obliquely rounded; ventral border convex; anterior border cuneiform and posterior slightly curved. Carapace surface smooth.

Internal view — Left valve — Dorsal border higher in median portion descending strongly towards anterior and posterior borders; anterior and posterior borders obliquely rounded. Left valve hinge formed of groove with coarse crenulation in both ends and finer crenulation in posteromedian portion, which appears as a small elongate elevation. Wide marginal zone, with straight pore canals. Anterior and posterior vestibule distinct. Simple and scattered normal pore canals. Scar elongate and curve, a characteristic of the *Xestoleberididae* close to anterodorsal portion of valve.

Dimensions

Hypotypi — Left valve: length 0.48mm; height 0.24mm
Right valve: length 0.47mm; height 0.22mm
Complete carapace: length 0.47mm; height 0.22mm; width 0.32mm

Discussion: Internally coincides with *Xestoleberis subglobosa* (Bosquet, 1852) emend. Keij, 1957 represented by the later in his Plate 8, figure 21. Externally resembles *X. chamela* van den Bold, 1960. It might be a new species.

Occurrence: Pelotas Basin, State of Rio Grande do Sul, Brasil. PETROBRÁS Drillings: 2-PS-1-RS, core 6 (320 – 322m); 2-GA-1-RS, cores 37 (129,40 – 132,45m), 39 (133,40 – 138,98m); 2-GA-2-RS, cores 5 (108,50 – 111,55m), 6 (111,55 – 114,60m); 2-CI-1-RS, core 4 (405 – 408m); 2-PN-1-RS, core 4 (202 – 205m).

Sub Ordo Platycopina Sars, 1865

Família Cytherellidae Sars, 1865

Genus *Cytherella* Jones, 1849

Diagnosis: In this peculiarly distinct group the carapace valves are oblong, and vary in the convexity and smoothness of surface. The right valve is larger than the left and its contact-margin thicker than that of the opposite valve. A groove, excavated along the inner edge of the contact-margin of the right valve, receives a narrow trenchant ridge or flange, which runs along the inner edge of the contact margin of the left valve. The outer edge of the anterior margin is itself sometimes produced into a slight ridge, which in the closed carapace lies outside the flange of the opposite valve. The outer part of the contact-margin of the left valve lies against, but does not wholly cover especially on the posterior and dorsal borders, the salient outer half of the contact-margin of the right valve, the margin of the larger valve projecting beyond but not overlapping the smaller valve. The substance of the shell of *Cytherella* is somewhat greater in the posterior than in the anterior parts of both valves, the thickness gradually increasing from before backwards; so that in the large valve the groove on the anterior margin is slight, and accompanied by a narrow outer boundary, while posteriorly the salient part of the contact-mar-

gin is broader than the groove. From the same cause the flange of the lesser valve occupies nearly the whole thickness of the anterior margin, although at this part it is thin and low. It gradually increases in size towards the posterior extremity, where it is strongly marked, and where the accompanying boundary of contact-margin is as broad as the base of the ridge. The valves of *Cytherella* exhibit a small round tubercle on their inner surface between the center and dorsal margin, which is faintly marked in the young shell and increases in size with the age of the individual.

Species typus — *Cytherina ovata* Roemer, 1840, p.104, Pl. 16, Fig. 21a-b. Designated by Ulrich, 1894.

Cytherella sp.

Plate 8, figures 3a-b

Hypotypi: Right valve n. MP-0-455. Complete carapace n. MP-0-456.

Locus: Pelotas Basin, State of Rio Grande do Sul, Brasil PETROBRÁS Drilling: 2-PN-1-RS, core 4 (202 – 205m)

Stratum: Subzone *Hemicytherura howei*, Zone *Henryhowella evax* (Miocene)

Description: External view — Unequal valves: right valve slightly overlapping the left along all extension of carapace. Carapace in lateral view quadrangular rounded, higher in anterior portion, slightly inflated in posterior. Dorsal and ventral borders straight; anterior rounded and posterior obliquely rounded; slight elongate constriction and perpendicular to dorsal border located in median portion of valves. Carapace surface covered by distinct punctae, arranged concentrically, those of median portion of valves presenting bigger diameter. Carapace in dorsal view, ovoid elongate.

Internal view — Carapace outline corresponds to that of external view. Fitting of valves done by means of a groove in right valve and a salience in left valve. They are thin and stretching out along all periphery of the carapace as is characteristic for the genus.

Dimensions

Hypotypi — Right valve: length 0.65mm; height 0.34mm
Complete carapace: length 0.58mm; height 0.28mm; width 0.18mm

Discussion: The present form was compared with *Cytherella abyssorum* Sars, 1865 and *C. caelata* van den Bold, 1963. There is only a little resemblance in outline and type of sculpture with both species. It might be a new species.

Occurrence: Pelotas Basin, State of Rio Grande do Sul, Brasil. PETROBRÁS Drillings: 2-GA-1-RS, core 39 (133,40 – 138,98m); 2-GA-2-RS, core 8 (117,65 – 120,70m); 2-PS-1-RS, core 6 (320 – 322m); 2-PN-1-RS, core 4 (202 – 205m).

Diagnosis: Carapace in side view, roughly oblong-ovate or subquadrangular. Carapace compressed, especially in front; internal cavity shallow. Greatest width of carapace at posterior end. The two valves are subequal, the right valve being very slightly larger than left, and never overlapping it strongly or extending beyond it for more than a very short distance along the periphery. The hinge structure, as in *Cytherella*, consists of a groove in the right and a flange in the left valve. Surface always more or less sculptured, bearing tubercles, ridges, and pits, and usually with a narrow, convex marginal ridge extending around the periphery of the valves.

Species typus — *Cytherella williamsoniana* Jones, 1849, p.31, Pl. 7, Fig. 26-a-i

Cytherelloidea sp.

Plate 8, figure 4

Hypotypus: Right valve n. MP-0-457

Locus: Pelotas Basin, State of Rio Grande do Sul, Brasil PETROBRÁS Drilling: 2-PS-1-RS, core 5 (270 – 273m).

Stratum: Subzone *Hemicytherura howei*, Zone *Henryhowella ewax* (Miocene).

Description: External view — Right valve — In lateral view presents a subquadrangular form. Dorsal border slightly curved, posterior border with median rounded narrowing, anterior border rounded and ventral border with slight re-entrance in median portion. Absence of rim along periphery. Prominent and transversal elevation in posterior border; three longitudinal ridges which originate in this elevation: dorsal and median are curved; and ventral more or less straight. Ridges are intercalated by elongate and prominent grooves.

Internal view — Right valve — Groove distinct along dorsal border and free margin. Valve wall with two circular re-entrances, in posterior border, perhaps defining a female.

Dimensions

Hypotypus — Right valve: length 0.81mm; height 0.42mm

Discussion: In the material here studied, there are only two right valves of the present form, and no similar species was found in bibliography checked. For these two reasons the species is kept undetermined.

Occurrence: Pelotas Basin, State of Rio Grande do Sul, Brasil. PETROBRÁS Drillings: 2-GA-1-RS (141,83m); 2-PS-1-RS, core 5 (270 – 273m).

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PLATE 1

- Fig. 1 — *Bairdoppilata triangulata* Edwards, 1944
 Homotypus n. MP-0-398 — 1a. Right lateral view 1b. Dorsal view
 Homotypus n. MP-0-458 — 1c. Right internal view 45X
- Fig. 2 — *Paracypris* sp.
 Hypotypus n. MP-0-400 — 2a. Right lateral view
 Hypotypus n. MP-0-399 — 2b. Left lateral view
 Hypotypus n. MP-0-459 — 2c. Dorsal view 55X
- Fig. 3 — *Rocaleberis bertelsae* Sanguinetti, sp. nov.
 Female, Holotypus n. MP-0-401 A, B — 3a. Right lateral view 3b. Left lateral view 3c. Dorsal view
 Male, Paratypus n. MP-0-402 A, B — 3d. Right lateral view 3e. Left lateral view 3f. Dorsal view 55X

PLATE 2

55X

Fig. 1 — *Rocaleberis sylvesterbradleyi* Sanguinetti sp. nov.

Female, Paratypus n. MP-0-405 — 1a. Right lateral view

Female, Holotypus n. MP-0-403 — 1b. Left lateral view 1c. Dorsal view

Male, Paratypus n. MP-0-404 — 1d. Left lateral view 1e. Dorsal view

Fig. 2 — *Cytheretta punctata* Sanguinetti, sp. nov.

Female, Holotypus n. MP-0-406 A, B — 2a. Right lateral view 2b. Left lateral view

Female, Paratypus n. MP-0-407 — 2c. Dorsal view

Male, Paratypus n. MP-0-408 — 2d. Left lateral view 2e. Dorsal view

PLATE 3

55X

- Fig. 1 — *Bensonina midipunctata* Sanguinetti, sp. nov.
Female, Paratypus n. MP-0-410 — 1a. Right lateral view
Female, Holotypus n. MP-0-409 — 1b. Left lateral view
Female, Paratypus n. MP-0-411 — 1c. Left lateral view (juvenile stage)
Female, Paratypus n. MP-0-413 — 1d. Dorsal view
Male, Paratypus n. MP-0-412 — 1e. Left lateral view (juvenile stage)
Male, Paratypus n. MP-0-414 — 1f. Dorsal view
- Fig. 2 — *Bensonina minipunctata* Sanguinetti, sp. nov.
Male, Holotypus n. MP-0-415 A, B — 2a. Right lateral view 2b. Left lateral view
Male, Paratypus n. MP-0-470 — 2c. Dorsal view
Female, Paratypus n. MP-0-416 — 2d. Left lateral view
Female, Paratypus n. MP-0-469 — 2e. Dorsal view

PLATE 4

- Fig. 1 — *Bensonina tripunctata* Sanguinetti, sp. nov.
Holotypus n. MP-0-417 — 1a. Left lateral view. 1b. Dorsal view
Paratypus n. MP-0-418 — 1c. Right lateral view
Paratypus n. MP-0-419 — 1d. Left lateral view

55X

- Fig. 2 — *Krithe trinidadensis* van den Bold, 1958
Female, Homotypus n. MP-0-420 — 2a. Right lateral view
Female, Homotypus n. MP-0-421 — 2b. Left lateral view

55X

- Fig. 3 — *Cytheropteron tuberculatum* Sanguinetti, sp. nov.
Holotypus n. MP-0-422 A, B — 3a. Right lateral view 3b. Left lateral view
Paratypus n. MP-0-423 A, B (juvenile stage) — 3c. Right lateral view 3d. Left lateral view
Paratypus n. MP-0-424 — 3e. Dorsal view

110X

PLATE 5

- Fig. 1 — *Hemicytherura howei* (Puri, 1953) emend. Sanguinetti, 1979
 Female, Plesiotypus n. MP-0-425 — 1a. Right lateral view
 Female, Plesiotypus n. MP-0-426 — 1b. Left lateral view
 Female, Plesiotypus n. MP-0-428 — 1c. Dorsal view
 Male, Plesiotypus n. MP-0-427 — 1 d. Left lateral view
 110X
- Fig. 2 — *Aurila trigonula* (Jones, 1856) van den Bold, 1957
 Homotypus n. MP-0-429 A, B — 2a. Right lateral view 2b. Left lateral view
 75X
- Fig. 3 — *Australicythere bensoni* Sanguinetti, sp. nov.
 Male, Holotypus n. MP-0-430 A, B — 3a. Right lateral view 3b. Left lateral view
 Female, Paratypus n. MP-0-432 — 3c. Left lateral view
 Female, Paratypus n. MP-0-431 — 3d. Dorsal view
 55X
- Fig. 4 — *Caudites diagonalis* Sanguinetti, sp. nov.
 Holotypus n. MP-0-433 A, B — 4a. Right lateral view 4b. Left lateral view 4c. Dorsal view
 55X

PLATE 6

- Fig. 1 — *Callistocythere litoralensis* (Rossi de Garcia, 1966) Sanguinetti, 1979
 Female, Plesiotypus n. MP-0-435 — 1a. Right lateral view
 Female, Plesiotypus n. MP-0-434 — 1b. Left lateral view
 Male, Plesiotypus n. MP-0-436 — 1c. Left lateral view 1d. Dorsal view
 110X
- Fig. 2 — *Callistocythere litoralensis* (Rossi de Garcia, 1966) Sanguinetti, 1979
 Topotypus — 2a. Right lateral view
 Topotypus — 2b. Left lateral view
 110X
- Fig. 3 — *Pellucistoma gibosa* Sanguinetti, sp. nov.
 Holotypus n. MP-0-437 — 3a. Right lateral view
 Paratypus n. MP-0-438 — 3b. Left lateral view
 Paratypus n. MP-0-439 — 3c. Dorsal view
 85X
- Fig. 4 — *Bradleya rheingantzi* Sanguinetti, sp. nov.
 Paratypus n. MP-0-448 — 4a. Right lateral view
 Holotypus n. MP-0-447 — 4b. Left lateral view
 Paratypus n. MP-0-449 — 4c. Dorsal view
 55X
- Fig. 5 — *Orionina vughani* (Ulrich et Bassler, 1904) Puri, 1953
 Female (?), Homotypus n. MP-0-450 A, B — 5a. Right lateral view 5b. Left lateral view
 Male (?), Homotypus n. MP-0-451 — 5c. Right lateral view
 55X

PLATE 7

- Fig. 1 — *Munseyella punctata* van den Bold, 1958
 Female, Homotypus n. MP-0-441 — 1a. Right lateral view
 Female, Homotypus n. MP-0-440 — 1b. Left lateral view
 Female, Homotypus n. MP-0-443 — 1c. Dorsal view
 Male, Homotypus n. MP-0-442 — 1d. Right lateral view 1e. Dorsal view
 110X
- Fig. 2 — *Munseyella vandenboldi* Sanguinetti, sp. nov.
 Female, Holotypus n. MP-0-444 A, B — 2a. Right lateral view 2b. Left lateral view
 Female, Paratypus n. MP-0-446 — 2c. Dorsal view
 Male, Paratypus n. MP-0-445 — 2d. Right lateral view
 110X
- Fig. 3 — *Quadracythere nealei* Sanguinetti, sp. nov.
 Male, Holotypus n. MP-0-460 A, B — 3a. Right lateral view 3b. Left lateral view 3c. Dorsal view
 Female, Paratypus n. MP-0-461 A, B — 3d. Right lateral view 3e. Left lateral view 3f. Dorsal view
 55X

PLATE 8

- Fig. 1 — *Henryhowella evax* (Ulrich et Bassler, 1904) Puri, 1957
 Male, Homotypus n. MP-0-463 — 1a. Right lateral view
 Male, Homotypus n. MP-0-462 — 1b. Left lateral view
 Male, Homotypus n. MP-0-464 — 1c. Dorsal view
 Male, Homotypus n. MP-0-465 — 1f. Right lateral view
 Female, Homotypus n. MP-0-467 — 1d. Right lateral view
 Female, Homotypus n. MP-0-466 — 1e. Left lateral view
 Female, Homotypus n. MP-0-468 — 1g. Dorsal view

55X

- Fig. 2 — *Xestoleberis* sp.
 Hypotypus n. MP-0-453 — 2a. Right lateral view
 Hypotypus n. MP-0-452 — 2b. Left lateral view
 Hypotypus n. MP-0-454 — 2c. Dorsal view

85X

- Fig. 3 — *Cytherella* sp.
 Hypotypus n. MP-0-456 — 3a. Right lateral view 3b. Dorsal view

85X

- Fig. 4 — *Cytherelloidea* sp.
 Hypotypus n. MP-0-457 — Right lateral view

55X

PLATE 9

- Fig. 1 — *Bairdoppulata triangulata* Edwards, 1944
Homotypus n. MP-0-458 — Right internal view 60X
- Fig. 2 — *Paracypris* sp.
Hypotypus n. MP-0-399 — 2a. Left internal view
Hypotypus n. MP-0-400 — 2b. Right internal view 80X
- Fig. 3 — *Rocaleberis bertelsae* Sanguinetti sp. nov.
Female, Holotypus n. MP-0-401 A, B — 3a. Left internal view 3b. Right internal view 80X
- Fig. 4 — *Rocaleberis sylvesterbradleyi* Sanguinetti sp. nov.
Female, Paratypus n. MP-0-405 — Right internal view 80X
- Fig. 5 — *Cytheretta punctata* Sanguinetti sp. nov.
Female, Holotypus n. MP-0-406 A, B — 5a. Left internal view 5b. Right internal view 80X

PLATE 10

80X

- Fig. 1 — *Bensonia midipunctata* Sanguinetti, sp. nov.
Female, Holotypus n. MP-0-409 — 1a. Left internal view
Female, Paratypus n. MP-0-410 — 1b. Right internal view
- Fig. 2 — *Bensonia minipumctata* Sanguinetti, sp. nov.
Male, Holotypus n. MP-0-415 A, B — 2a. Left internal view 2b. Right internal view
- Fig. 3 — *Bensonia tripunctata* Sanguinetti, sp. nov.
Holotypus n. MP-0-417 — 3a. Left internal view
Paratypus n. MP-0-418 — 3b. Right internal view
- Fig. 4 — *Krithe trinidadensis* van den Bold, 1958
Female, Homotypus n. MP-0-421 — 4a. Left internal view
Female, Homotypus n. MP-0-420 — 4b. Right internal view

PLATE 11

- Fig. 1 — *Cytheropteron tuberculatum* Sanguinetti, sp. nov.
Holotypus n. MP-0-422 A, B — 1a. Left internal view 1b. Right internal view 150X
- Fig. 2 — *Hemicytherura howei* (Puri, 1953) emend. Sanguinetti, 1979
Male, Plesiotypus n. MP-0-427 — 2a. Left internal view 150X
Female, Plesiotypus n. MP-0-425 — 2b. Right internal view
- Fig. 3 — *Aurila trigonula* (Jones, 1856) van den Bold, 1957
Homotypus n. MP-0-429 — Right internal view 100X
- Fig. 4 — *Australicythere bensoni* Sanguinetti, sp. nov.
Holotypus n. MP-0-430 A, B — 4a. Left internal view 4b. Right internal view 80X
- Fig. 5 — *Caudites diagonalis* Sanguinetti, sp. nov.
Holotypus n. MP-0-433 A, B — 5a. Left internal view 5b. Right internal view 80X

PLATE 12

- Fig. 1 — *Callistocythere litoralensis* (Rossi de Garcia, 1966) Sanguinetti, 1979
 Female, Plesiotypus n. MP-0-434 — 1a. Left internal view
 Female, Plesiotypus n. MP-0-435 — 1b. Right internal view

150X

- Fig. 2 — *Pellucistoma gibosa* Sanguinetti, sp. nov.
 Paratypus n. MP-0-438 — 2a. Left internal view
 Holotypus n. MP-0-437 — 2b. Right internal view
 Paratypus n. MP-0-439 — 2c. Dorsal view

120X

- Fig. 3 — *Munseyella vandenboldi* Sanguinetti, sp. nov.
 Female, Holotypus n. MP-0-444 A, B — 3a. Left internal view 3b. Right internal view

150X

- Fig. 4 — *Bradleya rheingantzi* Sanguinetti, sp. nov.
 Holotypus n. MP-0-447 — 4a. Left internal view
 Paratypus n. MP-0-448 — 4b. Right internal view

80X

PLATE 13

80X

- Fig. 1 — *Henryhowella evax* (Ulrich et Bassler, 1904) Puri, 1957
Male, Homotypus n. MP-0-462 — 1a. Left internal view
Male Homotypus n. MP-0-463 — 1b. Right internal view
- Fig. 2 — *Orionina vughani* (Ulrich et Bassler, 1904) Puri, 1953
Female, Homotypus n. MP-0-450 A, B — 2a. Left internal view 2b. Right internal view
- Fig. 3 — *Quadracythere nealei* Sanguinetti, sp. nov.
Male, Holotypus n. MP-0-460 A, B — 3a. Left internal view 3b. Right internal view
Female, Paratypus n. MP-0-461 A, B — 3c. Left internal view 3d. Right internal view