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Holocene Podocopida Ostracoda from Sepetiba Bay, Brazil -
Some Dominant Taxa

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Abstract- This paper presents the first stage of the taxonomic study of the Holocene ostracodes from Sepetiba Bay, with a description of *Whatleyella sanguinettiae* gen. et sp. nov.. Three previously described species, *Callistocythere litoralensis* (Rossi de Garcia, 1966), *Tanella gracilis* Kingma, 1948 and *Keijella dictyon* (Bold, 1966) are recorded, and *Callistocythere ornata* (Hartmann, 1956) is re-described with SEM illustrations. The geographical distribution of these species seems to indicate a possible extension southwards of the limit of the Transitional Assemblage which occurs between the Eastern and Southern shelves of Brazil, up to Lat. 23° S.

Resumo - No presente trabalho é apresentada a primeira etapa do estudo taxonômico dos ostracodes da Baía de Sepetiba, com a descrição de *Whatleyella sanguinettiae* gen. et sp. nov.. Três espécies previamente descritas por outros autores, foram aqui identificadas: *Callistocythere litoralensis* (Rossi de Garcia, 1966), *Tanella gracilis* Kingma, 1948 e *Keijella dictyon* (Bold, 1966). *Callistocythere ornata* (Hartmann, 1956) é redescrita com o auxílio de fotografias em microscópio eletrônico de varredura. É discutida a distribuição geográfica dessas espécies, e a probabilidade de que indiquem a extensão do limite sul da Assembléia de Transição, localizada entre as plataformas leste e sul do Brasil, até a latitude de 23°S.

INTRODUCTION

Despite of the increasing number of studies on the marine ostracodes from Brazil (Dias-Brito *et al.*, 1988; Azevedo, 1988; Coimbra & Ornellas, 1989; Coimbra, *et al.*, 1992; Carmo, 1993; Coimbra, *et al.*, in press; Ramos, in press), the knowledge of the faunas of this region remains very unfinished.

The main purpose of this paper is to describe the most abundant species of ostracodes studied by Dias-Brito *et al.* (*op. cit.*) which were considered only at the generic level (Tbl. 1). Although limited to the most abundant species, it forms an important contribution to the understanding of the distribution of the Brazilian ostracode fauna. The analysis of the geographical distribution of these ostracodes left to a new interpretation of the South limit of the Transitional Assemblage proposed by Coimbra & Ornellas (1989) for the Brazilian continental shelf.

Sepetiba Bay is a semi-confined clastical coastal lagoon ecosystem of some 305 km² (Moura *et al.*, 1982). It is a part of the Guaratiba / Sepetiba complex coastal sedimentary environment, which occurs between Lat. 22° and 23° S and Long. 44° and 43°W. It is limited to the North by land, to the East by the Guaratiba tidal flat, to the South by the Marambaia Beach Ridge and to the West by a string of metamorphic islands, such as: Itacuruçá Island and Jaguanum Island (Fig. 1). A detailed study of the biotic and environmental parameters was made by Bronnimann *et al.* (1981), Moura *et al.* (*op. cit.*) and Dias-Brito *et al.* (*op. cit.*).

The 176 samples of the bottom sediment were collected by the research center of Petróleo Brasileiro S/A (PETROBRÁS) between May and August 1978, using a Van Veen dredge. The samples represent the uppermost 5cm.

The type-material is deposited at the Museu de Paleontologia of Universidade Federal do Rio Grande do Sul (UFRGS), Ostracoda (MP-O) and at the Museu de Paleontología, Micropalaeontological Collection, of Universidad Nacional Autónoma de Mexico (UNAM), Micropalaeontology (IGM - Mi).

TAXONOMY

Order Podocopida Müller, 1874
Suborder Podocopina Sars, 1865
Family Leptocytheridae Hanai, 1957

Callistocythere Ruggieri, 1953

Type-species- *Cythere litoralis* Müller, 1894, p. 353, pl. 28, fig. 18.

Callistocythere litoralensis (Rossi de García, 1966)
Pl. 1, Figs. 1-7

Callistocythere litoralensis (Rossi de García). Sanguinetti, Ornellas & Coimbra, 1991, p. 148, pl. 4, figs. 1-11. See this for complete synonymy.

Dias-Brito <i>et al.</i> (1988)	In this paper
<i>Callistocythere</i> sp. 1 Pl. 1, Fig. 11	<i>Callistocythere ornata</i> (Hartmann, 1956) Pl. 1, Figs. 8-13; Pl. 2, Figs. 1-4
<i>Callistocythere</i> sp. 2 Pl. 1, Fig. 12	<i>Callistocythere litoralensis</i> (Rossi de García, 1966) Pl. 1, Figs. 1-7
<i>Tanella</i> sp. Pl. 1, Fig. 18	<i>Tanella gracilis</i> Kingma, 1948 Pl. 2, Figs. 5-13
<i>Pistocythereis</i> sp. 1 Pl. 1, Fig. 18	<i>Keijella dyction</i> (Bold, 1966) Pl. 3, Figs. 8-11
<i>Pistocythereis</i> sp. 2 Pl. 1, Fig. 19	<i>Keijella dyction</i> (Bold, 1966) Pl. 3, Figs. 8-11
<i>Perissocytheridea</i> sp. 1 Pl. 1, Fig. 1	<i>Whatleyella sanguinettiae</i> gen. et sp. nov. Pl. 3, Figs. 1-7

Table 1 - A comparison between the taxa identified by Dias-Brito *et al.* (1988) and those presented in this paper.

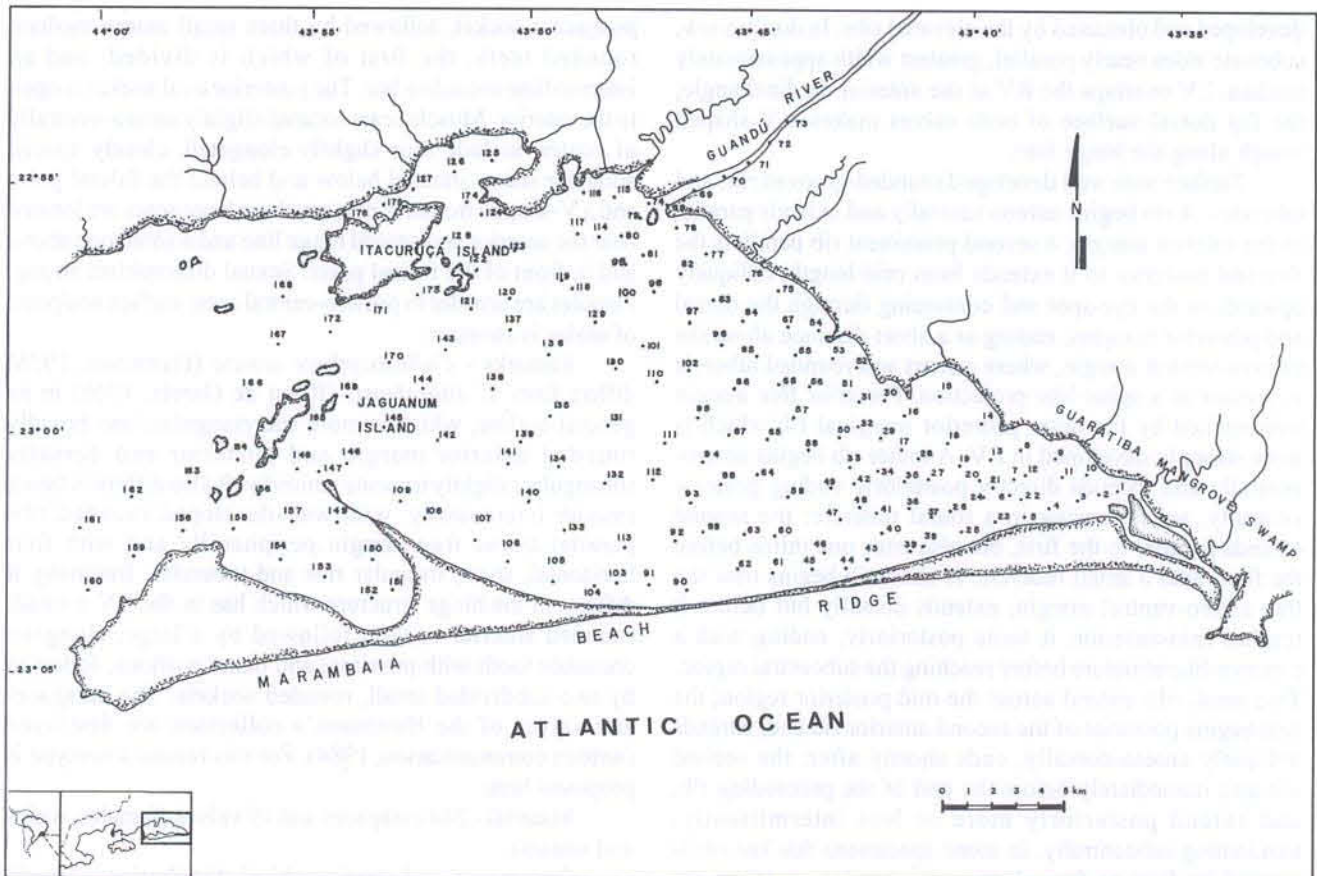


Figure 1 - Sketchmap showing the Sepetiba Bay and sampling sites (modified of Moura *et al.*, 1988)

Figured specimens - MP-O-1456, CF, length 0.425mm, height 0.250mm, width 0.200mm (BS-162); MP-O-1457, CF, length 0.425mm, height 0.250mm, width 0.200mm (BS-162); MP-O-1458, CF, length 0.425mm, height 0.250mm, width 0.200mm (BS-25); MP-O-1459, CF, length 0.425mm, height 0.250mm, width 0.200mm (BS-162); MP-O-1460, LV M, length 0.375mm, height 0.225mm (BS-25).

Remarks - This species differs from *Callistocythere ornata* (Hartmann, 1956) in its general outline, which is more broadly rounded antero-ventrally, a nearly straight ventral margin, an arched dorsal margin and a more pronounced anterior cardinal angle. It also differs in its pitted surface with ribs strongly developed and parallel to the free margin peripherally, with a subcircular pattern mid-anteriorly. Internally, it differs slightly in hingement from *Callistocythere ornata* (Hartmann, 1956) in having in the LV an anterior rounded tooth and an anterior median element with elongated toothlets undivided.

Material - 401 carapaces and 41 valves (females, males and instars).

Occurrence and stratigraphical distribution - Argentina, Austral Basin (Upper Oligocene/Lower Miocene); Entre Ríos Formation (Miocene); Lower member of Paraná Formation (Upper Miocene); Colorado Basin (Upper Miocene / Lower Pliocene); Buenos Aires Province (Upper Pleistocene and Holocene). Uruguay, off coast (Recent). Brazil, Pelotas Basin (Miocene and Post Miocene); Sepetiba Bay (Recent), samples BS: 1, 3, 24, 25, 27, 33, 35, 42, 47, 48, 49, 50, 58, 59, 60, 63, 64, 65, 87, 88A, 89, 92, 93, 94, 100, 101, 109, 113, 124, 137, 141, 148, 149, 153, 158, 159, 160 to 167, 173.

Callistocythere ornata (Hartmann, 1956)
Pl. 1, Figs. 8-13; Pl. 2, Figs. 1-4

Leptocythere ornata Hartmann, 1956, p. 20-22, figs. 1-8.

Callistocythere sp. 1 Dias-Brito, Moura & Würdig, 1988, p. 479, pl. 1, fig. 11.

Neotype - MP-O-1464, CM, length 0.450mm, height 0.225mm, width 0.200mm (BS-109).

Locality - Sepetiba Bay, Rio de Janeiro State, Brazil, Station BS-109.

Figured specimens - MP-O-1461, CF, length 0.450mm, height 0.250mm, width 0.225mm (BS-1); MP-O-1465, CM, length 0.450mm, height 0.225mm, width 0.200mm (BS-109); MP-O-1466, CM, length 0.450mm, height 0.225mm, width 0.200mm (BS-109); MP-O-1467, CM, length 0.450mm, height 0.225mm, width 0.200mm (BS-109).

Diagnosis - Species characterized by its surface ornamentation with well developed grooved ribs parallel to the free margin peripherally and with four short, irregular, horizontal ribs; tuberculate and with short and rounded spine-like projecting tubercle postero-ventrally.

Description - Medium sized carapace; subrectangular in lateral view and slightly compressed at ends. Highest at the anterior cardinal angle, widest in the posterior half. Dorsal margin moderately arched in LV, nearly straight in RV. Ventral margin centrally concave, nearly parallel to dorsal. Anterior margin, broadly and obliquely rounded, carrying antero-ventrally about nine small rounded denticles. Posterior margin depressed, narrowly rounded and slightly truncated ventrally, forming in the left valve a distinct posterior cardinal hinge ear-like angulation. Eye spot weakly

developed and obscured by the elevated ribs. In dorsal view, subovate sides nearly parallel, greatest width approximately median. LV overlaps the RV at the anterior cardinal angle; the flat dorsal surface of both valves makes a V-shaped trough along the hinge line.

Surface with well developed rounded-grooved ribs and tubercles. A rib begins antero-ventrally and extends parallel to the anterior margin; a second prominent rib parallels the first and posterior to it extends from mid-length, obliquely upwards to the eye-spot and continuing through the dorsal and posterior margins, ending at a short distance along the postero-ventral margin, where a short and rounded tubercle is present as a spine-like projection. Posterior free margin overreached by the outer posterior marginal rib which is more strongly developed in LV. Another rib begins antero-ventrally and extends directly posteriorly ending postero-ventrally, anastomosing in a round tubercle; the second extends parallel to the first, but also ends one thirds before the first, with a small tubercle. A short rib begins near the free antero-ventral margin, extends dorsally but before it reaches mid-anterior, it turns posteriorly, ending with a concave-like structure before reaching the subcentral region. Two small ribs extend across the mid posterior region; the first begins posterior of the second anterior rib and, extends obliquely antero-dorsally, ends shortly after; the second initiates immediately below the end of the preceding rib, and extend posteriorly more or less intermittently, terminating subcentrally. In some specimens this last rib is formed by four or five elongated tubercles. A lower rib begins at the dorsally-posterior third running obliquely to the ventrally-posterior region ending one thirds before reaching it. This rib in some specimens is interrupted at its mid-length. Intercostal areas smooth.

Inner lamella broad anteriorly and postero-ventrally; line of concrescence nearly coincides with inner margin. A poorly developed vestibulum is restricted to the anterior and postero-ventral areas. Radial pore canals polyfurcate antero-ventrally, short and branched posteriorly. Selvage proeminent in both valves, especially strong in the ventral sinuous margin, at RV the flange has a mid-ventral "snap-knob"; normal pore canals scattered, sieve-like. Hinge pseudoentomodont. RV consists of a small rounded anterior socket and a large, elongated anterior tooth which has an elevated and rounded proximal portion and a lower and elongate distal portion; two postjacent ovoid and divided antero-median sockets followed by a crenulate median groove and a postjacent, large, slightly crenulate tooth. The LV hinge consists anteriorly of small toothlets and a large

postjacent socket, followed by three small antero-median, rounded teeth, the first of which is divided, and an intermediate crenulate bar. The posterior oval socket is open to the interior. Muscle scars located slightly antero-ventrally of center, include four slightly elongated, closely spaced adductor scars, situated below and behind the fulcral point and a V-shaped frontal is present; three large scars are located near the anterior and central hinge line and a small one above and in front of the fulcral point. Sexual dimorphism strong. Females are broader in postero-central area; surface sculpture of males is stronger.

Remarks - *Callistocythere ornata* (Hartmann, 1956) differs from *C. litoralensis* (Rossi de García, 1966) in its general outline, which is more subretangular, less broadly rounded anterior margin and posterior end dorsally subangular, slightly truncate ventrally. It also differs in being smooth intercostally, with well-developed rounded ribs parallel to the free margin peripherally and with four horizontal, short, irregular ribs and tubercles. Internally it differs in the hinge structure which has in the RV a small, rounded anterior socket, followed by a large, elongate, crenulate tooth with proximal and distal portions, followed by two subdivided small, rounded sockets. The carapaces and valves of the Hartmann's collection are destroyed (written communication, 1984). For this reason a neotype is proposed here.

Material - 244 carapaces and 19 valves (females, males and instars).

Occurrence and stratigraphical distribution - Brazil, Ilhabela Island, São Paulo coast; Sepetiba Bay, samples BS: 1, 4, 23, 24, 37, 38, 39, 43, 44, 45, 74, 91, 103, 104, 105, 107, 108, 109, 115, 148, 156, 162, 164, 175, 176.

Tanella Kingma, 1948

Type-species - *Tanella gracilis* Kingma, 1948, p. 88, pl. 10, fig. 7a-d.

Tanella gracilis Kingma, 1948

Pl. 2, Figs. 5-13

Sylvestra seminis (Bonaduce, Masoli & Pugliese). Bonaduce, Russo & Barra, 1990, p. 281-282, pl. 1, fig. 1-7.

Sylvestra ? seminis (Bonaduce, Masoli & Pugliese). Bonaduce, Russo & Barra, 1990, p. 282, pl. 1, fig. 8.

Tanella gracilis Kingma. Witte, 1993, p. 31, pl. 4, figs. 13-15; p. 149-150, fig. 2, pl. 1, figs. 1-12. See this for complete synonymy.

Figured specimens - MP-O-1468, RV F, length 0.425mm,

Figures 1-7 - *Callistocythere litoralensis* (Rossi de García, 1966)

Female

1. Carapace, MP-O-1457, Left View. 179X
 2. Carapace, MP-O-1456, Right View. 178.5X
 3. Carapace, MP-O-1459, Dorsal View. 160X
 4. Right Valve, MP-O-1458, Internal View. 177X
 5. Left Valve, MP-O-1457, Internal View, 177X
- Male
6. Left Valve, MP-O-1460, Internal View. 278X
 7. Left Valve, MP-O-1460, Internal View. 278X

Plate 1

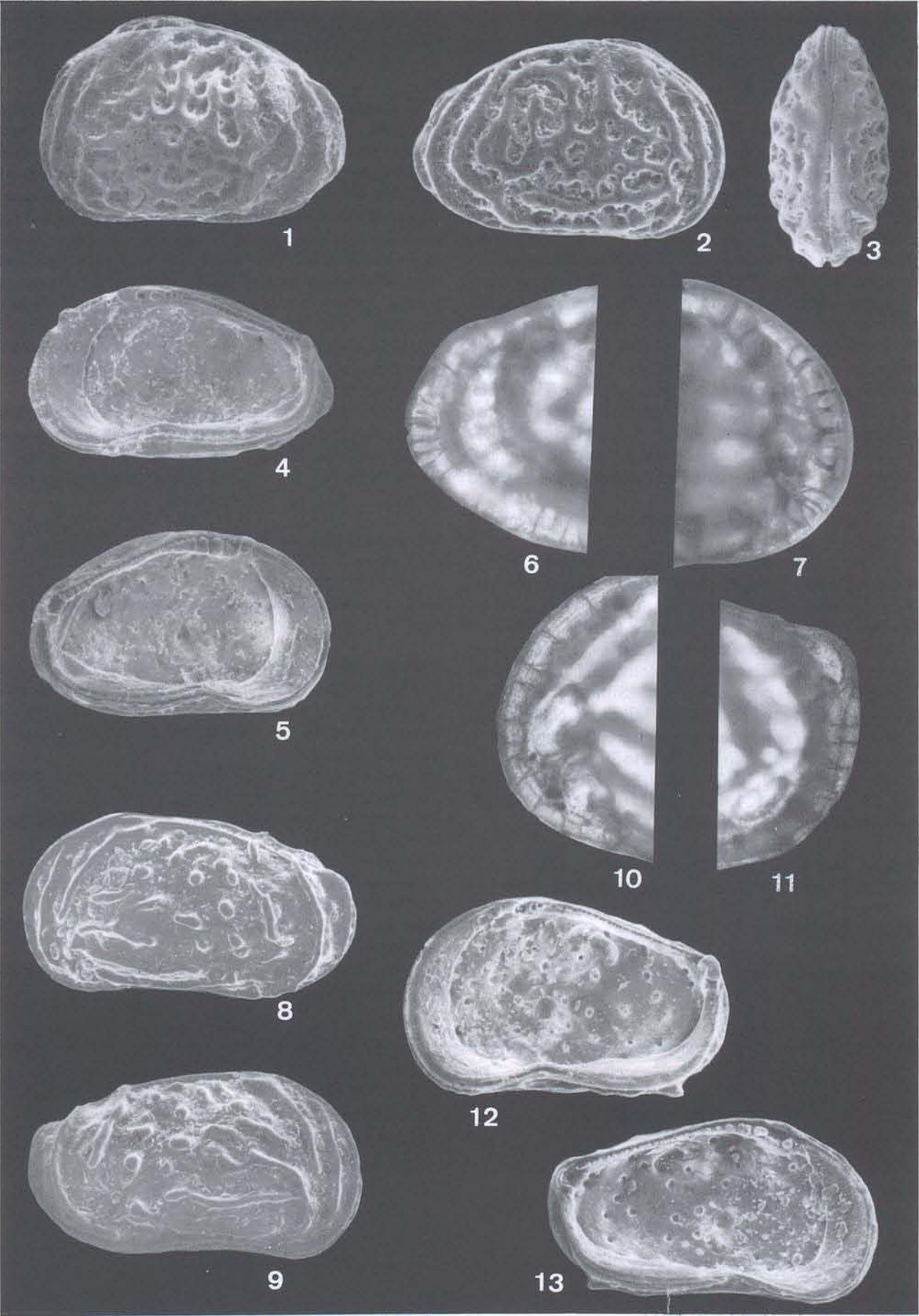
Figures 8-13 - *Callistocythere ornata* (Hartmann, 1956)

Female

12. Right Valve, MP-O-1461, Internal View. 177X
13. Left Valve, MP-O-1461, Internal View. 178X

Male

8. Carapace, MP-O-1465, Left View. 177.5X
9. Carapace, MP-O-1464, Right View. 177.5X
10. Right Valve, MP-O-1467, Internal View, 278X
11. Right Valve, MP-O-1467, Internal View, 278X



height 0.200mm (BS-8); MP-O-1469, LV F, length 0.500mm, height 0.250mm, width 0.250mm (BS-25); MP-O-1470, CF, length 0.425mm, height 0.200mm, width 0.175mm (BS-8); IGM-586-Mi, RV M, length 0.425mm, height 0.187mm (BS-8).

Remarks - The Brazilian material shows a great variability in the number and extension of its ribs. Nevertheless, it is possible to observe the same general ornamentation pattern of this species worldwide. The specimens were compared with *T. gracilis* homotypes from Laguna de Términos, Campeche, Mexico (Morales, 1966), deposited in the micropaleontological collection of the Instituto de Geología, UNAM, which were in turn previously compared with Kingma's type material from Sumatra. No major differences were noticed between them, except for the variability in the number of ribs and their extension, and the same is exhibited by the Brazilian population. This species is closely related to *Tanella foveata* (Hartmann, 1956) described from São Paulo State (Brazil), which has an ornamentation pattern similar to that exhibited by *T. gracilis*. Nevertheless, it differs from *T. foveata* in its dorsal margin which is slightly convex to nearly parallel, instead of highly convex.

Material - 457 carapaces and 166 valves (females, males and instars).

Occurrence and stratigraphical distribution - Gulf of Mexico, Florida, Gulf of Manar, Bay of Bengal, Pakistan, India, Malay Peninsula, Indonesia, Brunei, Gulf of Aden, Persian Gulf, Gulf of Oman, Red Sea, Gulf of Aqaba, Gulf of Suez, Australia, southeastern Africa, Mozambique, Réunion Islands, Micronesia, Solomon Islands, Hainan, Senegal and Gambia (Recent). Sumatra and Java (Pleistocene, Lower Pliocene and Miocene). Naples, Italy (Tyrrhenian); Brazil, Sepetiba Bay (Recent), samples BS: 1 to 5, 8 to 11, 14, 15, 21 to 27, 30, 33 to 39, 41 to 45, 47, 50, 52, 55, 59, 63, 64, 67, 75, 76, 77, 87, 88, 88A, 91 to 95, 103, 108, 109, 111, 112, 124, 125, 127, 130 to 132, 135 to 138, 141, 142, 148 to 157, 164, 168, 173 to 175.

Family Trachyleberididae Sylvester-Bradley, 1948
Subfamily Trachyleberidinae Sylvester-Bradley, 1948

Whatleyella gen. nov.

Type-species- *Whatleyella sanguinettiae* sp. nov.

Derivation of name - In honour to Dr. Robin Whatley, Institute of Earth Studies, University of Wales, in recognition of his invaluable contribution to the knowledge of Ostracoda.

Diagnosis - Carapace subrectangular in lateral view; anterior margin broadly rounded; posterior margin truncate above and rounded below; highest at the dorsal anterior cardinal angle. Surface coarsely reticulate. Eye tubercle well-developed. Inner lamella narrow. Normal pore canals scattered; radial pore canals straight and numerous. Hinge amphidont poor-developed; RV consists of a large, ovoid and crenulate anterior tooth and a large, elongated, subdivided antero-medial socket, followed by a crenulate median groove and a postjacent large, ovoid slightly crenulate tooth. Central muscle scars include four slightly elongated, closely spaced adductor scars, situated below and behind the fulcral point and a kidney- or V-shaped frontal scar is present.

Remarks - This genus resembles *Perissocytheridea* Stephenson, 1938 but differs from it in having the amphidont hinge and radial pore canals numerous while in *Perissocytheridea* the hinge is antimerodont and the radial pore canals are rather widely spaced.

Whatleyella sanguinettiae sp. nov.

Pl. 3, Figs. 1-7

Perissocytheridea sp. 1 Dias-Brito, Moura & Würdig, 1988, p. 479, pl. 1, fig. 1.

Derivation of name - In honour to Dr. Yvonne T. Sanguinetti, Instituto de Geociências, Departamento de Paleontologia e Estratigrafia, Universidade Federal do Rio Grande do Sul, in recognition of her contribution to the knowledge of Brazilian ostracodes.

Holotype - MP-O-1472, CF, length 0.475mm, height 0.250mm, width 0.225mm (BS-21).

Type locality - Sepetiba Bay, Rio de Janeiro State, Brazil. Station BS-21.

Paratypes - MP-O-1473, LV F, length 0.475mm, height 0.250mm (BS-21); MP-O-1474, CF, length 0.500mm, height 0.275mm, width 0.225mm (BS-21).

Allotypes - MP-O-1476, RV M, length 0.475mm, height 0.250mm (BS-24).

Locality - Sepetiba Bay, Rio de Janeiro State, Brazil. Stations BS-21 and BS-24.

Plate 2

Figures 1-4: *Callistocythere ornata* (Hartmann, 1956)

Female

1. Right Valve, MP-O-1461, Internal View. 783X

2. Left Valve, MP-O-1461, Internal View. 231X

3. Right Valve, MP-O-1461, Internal View. 279X

Male

4. Carapace, MP-O-1466, Dorsal View. 149.5X

Figures 5-13: *Tanella gracilis* Kingma, 1948

Female

5. Right Valve, MP-O-1469, External View. 159.5X

6. Left Valve, MP-O-1469, External View. 159.5X

7. Carapace, MP-O-1470, Dorsal View. 159.5X

8. Right Valve, MP-O-1468, Internal View. 159.5X

9. Left Valve, MP-O-1469, Internal View. 159.5X

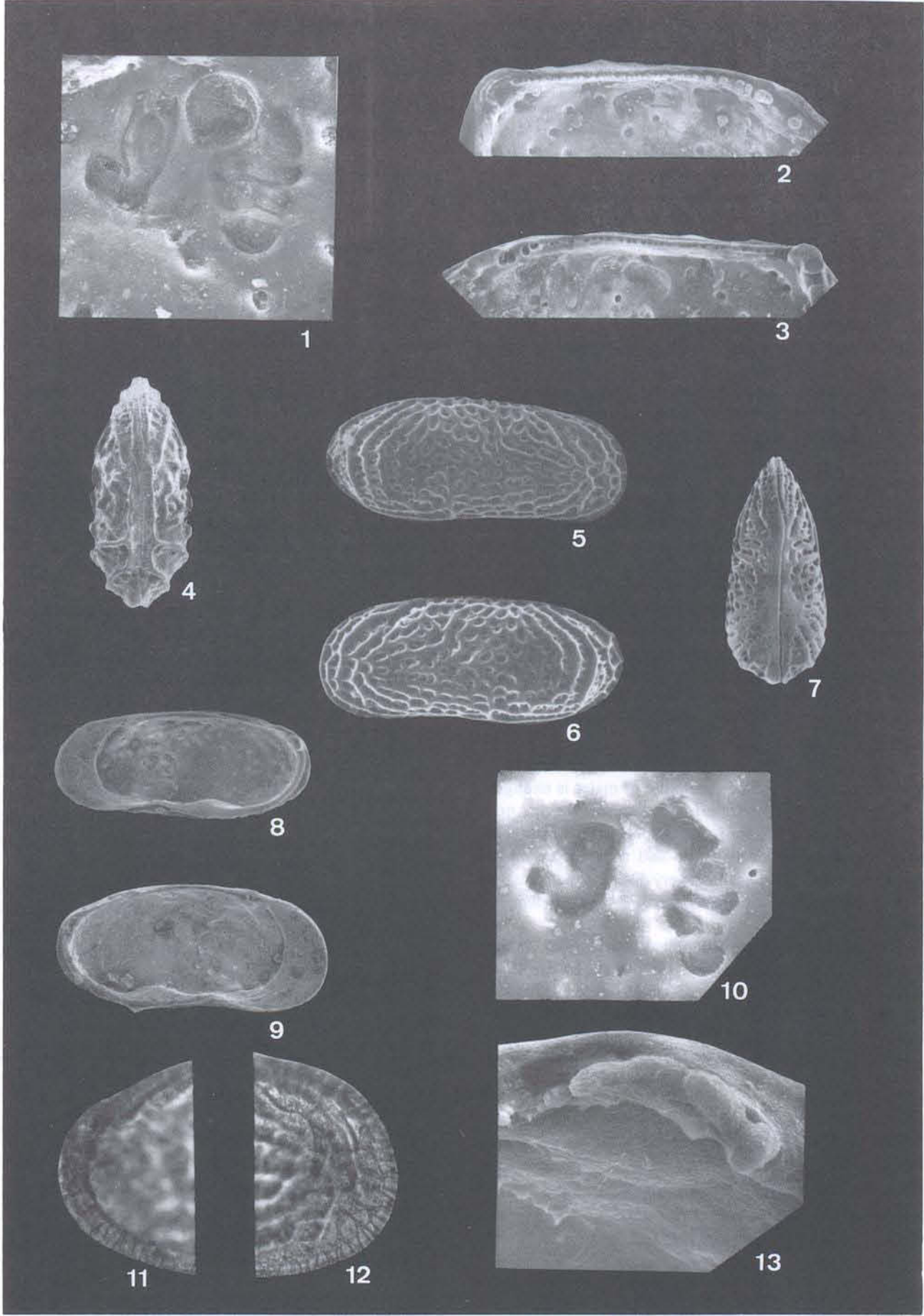
10. Right Valve, MP-O-1468, Internal View. 857.5X

11. Left Valve, MP-O-1469, Internal View. 278X

12. Left Valve, MP-O-1469, Internal View. 278X

Male

13. Right Valve, IGM-586-Mi, Internal View. 821X



Diagnosis - Species characterized by its surface ornamentated mid-anteriorly, ventrally and dorsally with a reticulate pattern and with a series of vertical and longitudinal ribs located mid-dorsally and antero-ventrally. Distinct anterior and posterior cardinal hinge-ears in RV. Anterior margin with a discrete flange carrying small denticles; ventrally selvage strongly thickened and widened in the centre in both valves; inner lamella narrow and avestibulate; normal pore canals open and scattered.

Description - Carapace medium sized, heavily calcified, subrectangular in lateral view; dorsal margin straight inclined towards posterior at RV with distinct anterior and posterior cardinal hinge-ears; ventral margin sinuous; anterior margin broadly rounded with a discrete flange carrying small denticles; posterior margin truncate above and rounded below; highest at the anterior cardinal angle, widest at the posterior half of the length. In dorsal view, subovate, LV overlaps RV throughout. Surface coarsely reticulate, particularly in the mid-anterior and at ventral, dorsal and posterior margins. A low rib extends parallel to dorsal, anterior and ventral margins. Postero-central surface ornamentated with six perpendicular undulating ribs; the two curved posterior ones continue into ventral and dorsal longitudinal ribs; the four anterior ones anastomosing to the dorsal rib and with an undulating rib that begins posteroventrally, extends obliquely, turning centrally and continuing longitudinally, ending within the anterior reticulum. Eye tubercle prominent.

Hinge and central muscle scars typical of the genus. Inner lamella narrow, line of concrescence nearly coincides with inner margin, selvage in the ventral and postero-ventral region well developed, particularly strongly thickened and widened in the centre in both valves. Normal pore canals scattered and open; radial pore canals, straight and numerous at the anterior and posterior margins.

Sexual dimorphism strong. Females are broader in postero-central area; surface sculpture of males is stronger.

Remarks - *Whatleyella sanguinettiae* sp. nov. resembles *Perissocytheridea* species, but differs from them in having the amphidont hinge and radial pore canals numerous. Furthermore, it has a very distinct ornamentation.

Material- 6011 carapaces and 1774 valves (females, males and instars).

Occurrence and stratigraphical distribution - Brazil, Sepetiba Bay (Recent), samples BS: 2 to 12, 14, 16, 19, 21 to 28, 30, 31, 33 to 50, 52 to 54, 58 to 60, 62 to 67, 75 to 78, 81 to 84, 87, 88, 88A, 89, 91 to 114, 116 to 145, 147 to 159, 163 to 176.

Subfamily uncertain

Keijella Ruggieri, 1967

Pseudokeijella Dingle, 1992.

Venericythere Mostafawi, 1992.

Type-species: *Cythere hodgii* Brady, 1866, p. 373, pl. LIX, figs. 3a,b

Keijella dictyon (Bold, 1966) emend.

Pl. 3, Figs. 8-11

? *Cythere goujoni* Brady, 1880, p. 96, pl. XXV, figs. 7,a-g.

? *Trachyleberis goujoni* (Brady). Keij, 1954a, p. 356, pl. II, figs. 3-6.

Trachyleberis goujoni (Brady). Keij, 1954b, p. 222, pl. IV, fig. 10; pl. VI, fig. 8.

Ruggieria dictyon Bold, 1966, p. 49, pl. 3, figs. 1a,b; pl. 5, fig. 5.

Ruggieria dictyon Bold. Teeter, 1975, p. 456, figs. 13n,o; 14c.

Keijella gonia Zhao & Whatley, 1989, p. 181, pl. 3, figs. 7-10, 16.

Cythere euplectella Brady, Puri & Hulings, 1976, pl. 25, figs. 14-18.

Pistocythereis sp. 1 Dias-Brito, Moura & Würdig, 1988, p. 478, pl. 1, fig. 18.

Pistocythereis sp. 2 Dias-Brito, Moura & Würdig, 1988, p. 478, fig. 19.

Keijella gonia Zhao & Whatley, 1989, p. 181, pl. 3, figs. 7-10, 16.

Venericythere darwini (Brady). Mostafawi, 1992, p. 146, taf. 4, figs. 69-70.

Venericythere dictyon (Bold). Jelinek, 1993, p. 127, taf. 17, figs. 315-316.

[non] *Cythere goujoni* Brady, 1868, p. 78, pl. X, figs. 9-10.

[non] *Cythereis goujoni* Brady. Fyfan, 1916, p. 1182, figs. 10-11.

Figured specimens - MP-O-1479, LV F, length 0.699mm, height 0.410mm (BS-167); MP-O-1480, RV M, length 0.680mm, height 0.373mm (BS-127); MP-O-1481, RV M, length 0.654mm, height 0.380mm (BS-167); MP-O-1482, LV F, length 0.699mm, height 0.410mm (BS-173).

Remarks - The diagnosis is of Teeter (1975) with addition of the following features described by Zhao & Whatley (1989): "a species of *Keijella* characterized by quadrate to slit-like fossae oriented parallel to the margins. Postero-ventrally a prominent right angle is formed by the conjunction of vertical and horizontal muri".

Jelinek (1993) discusses the synonymic list reproduced here with some modifications. Nevertheless, that author had classified *Keijella dictyon* in the genus *Venericythere* Mostafawi, 1992, that in the authors' opinion is a junior synonym of *Keijella* Ruggieri, 1967.

Material - 160 carapaces and 81 valves (females, males and instars).

Plate 3

Figures 1-7 - *Whatleyella sanguinettiae* sp. nov.

Female

1. Left Valve, MP-O-1473, External View. 161X

2. Right Valve, MP-O-1472, External View. 161X

3. Carapace, MP-O-1474, Dorsal View. 159.5X

7. Left Valve, MP-O-1473, Internal View. 161.5X

Male

6. Right Valve, MP-O-1476, Internal View. 268.5X

4. Right Valve, MP-O-1476, Internal View. 843X

5. Right Valve, MP-O-1476, Internal View. 175X

Figures 8-11 - *Keijella dictyon* (Bold, 1966)

Female

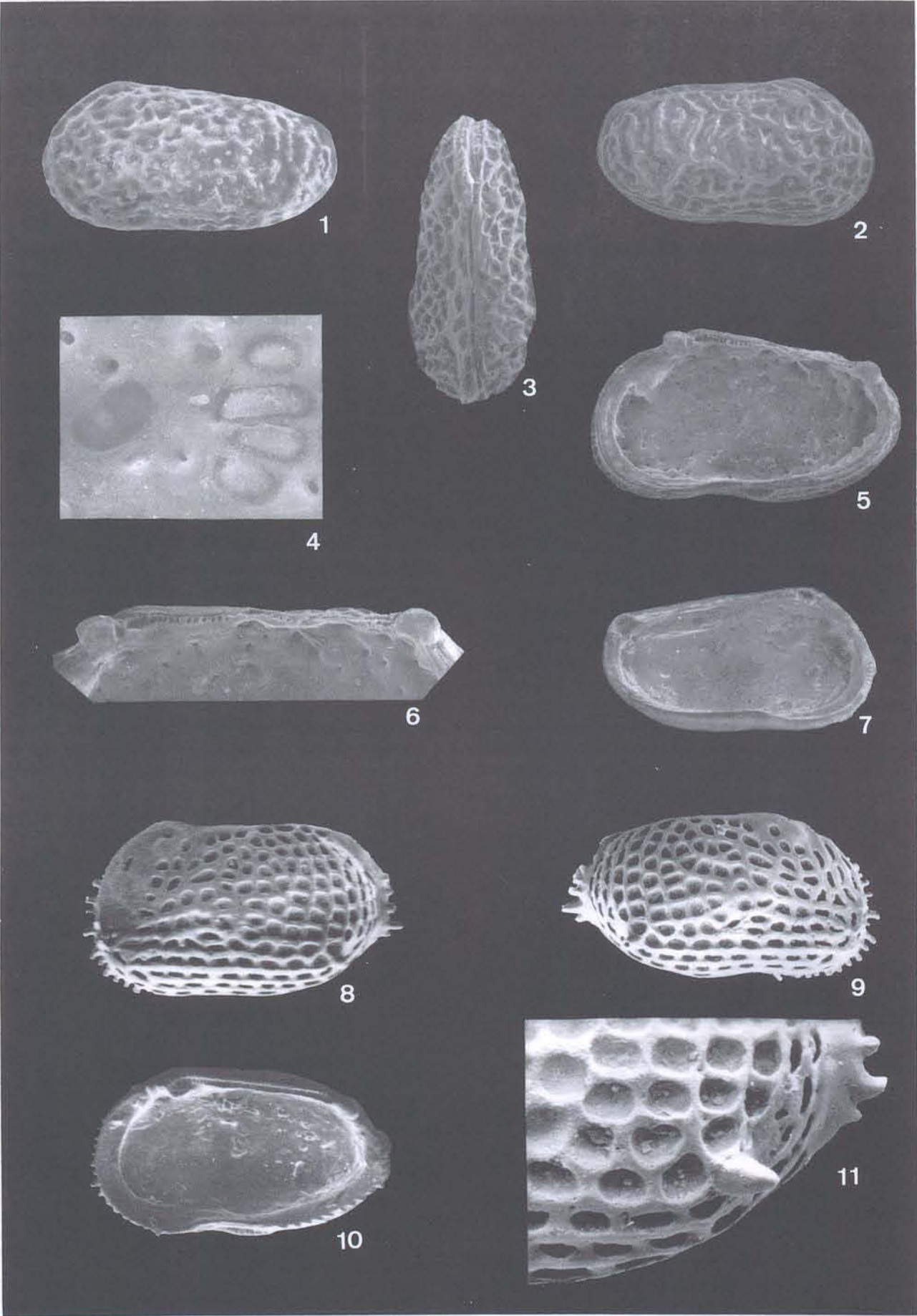
8. Left Valve, MP-O-1479, External View. 105.5X

11. Left Valve, MP-O-1482, External View. 275.5X

Male

9. Right Valve, MP-O-1481, External View. 107X

10. Right Valve, MP-O-1480, Internal View. 125X



Occurrence and stratigraphical distribution - Timor Island, Indonesia (Pliocene); Belize (Recent); Asia, Hong-Kong (Recent); Australia, Port Jackson and Booby Islands (Recent); North America, North Watcher Island, South Dakota, United States of America; Jason Bay, Falklands; Puerto Rico; Brazil, Sepetiba Bay (Recent), samples BS: 4, 5, 10, 21, 22, 26, 36, 37, 41, 46, 47, 63, 64, 93, 98, 100, 104, 106, 109, 111, 112, 121, 127, 128, 131, 132, 135 to 140, 142, 143, 149 to 154, 156 to 158, 164 to 168, 170 to 173, 175.

DISCUSSION AND CONCLUSIONS

Callistocythere litoralis originated in the Upper Oligocene/Lower Miocene of the northern part of the Austral Basin in southern of Argentina, where it lived together with a typical shallow water, euhaline and temperate fauna (Kielbovitz, 1988). According to data presented by Zabert (1978) this species occurs in a range of salinities similar to those which occur today in the Sepetiba Bay (Dias-Brito *et al.*, 1988) and in the Rio de La Plata Estuary (Whatley & Mognilevsky, 1975), where it is found both in mixohaline and euhaline environments. The first author of the present paper had noticed the presence of this species always accompanied by shallow, temperate to cold waters ostracode assemblage all along of the southern Brazilian continental shelf (Fig. 2a).

Callistocythere ornata, a euryhaline species, has a more limited distribution in Sepetiba Bay being preferentially found in the area around the Marambaia Beach Ridge and in sandy sediments while *C. litoralis* that is more commonly found in sandy mud (Dias-Brito *et al.*, *op. cit.*). On the Brazilian continental shelf, *C. ornata* had been found by the first author in samples from warm and shallow waters of the northern and northeastern regions, reaching the State of Rio de Janeiro at the southward limit of their distribution (Fig. 2a).

Tanella gracilis was considered highly polymorphic

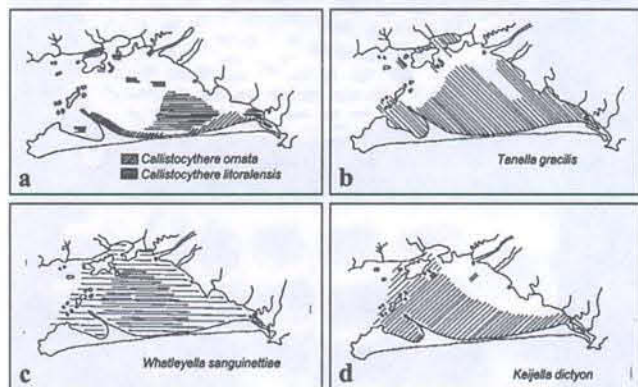


Figure 2 - Geographical distribution of the dominant ostracode species into Sepetiba Bay (modified of Dias-Brito *et al.*, 1988)

by Morales (1966) and with a wide distribution. Titterton & Whatley (1988) suggest that migration to achieve its present day distribution was both westward and eastward from the Indonesian/Philippine region, assisted by the world's major ocean surface currents. Recently, Witte (in press) suggested

that this species, now well established on both sides of the tropical Atlantic, was introduced there by passive dispersal through shipping. On the other hand, in the Dr. Robin Whatley opinion (personal communication, 1994) the Witte's hypothesis is very unlikely. In Sepetiba Bay this is the second most common species (Fig. 2b).

Whatleyella sanguinettiae gen. et sp. nov. is known only in Sepetiba Bay. It is the most abundant and widespread and euryhaline species (Fig. 2c).

Keijella dictyon is a cosmopolitan species, widely distributed in tropical shallow marine environments and typical of marginal gulf facies. In Sepetiba Bay this species is widely distributed in biofacies 9, defined by Dias-Brito *et al.* (*op. cit.*), where the environment is typically marine. *Keijella dictyon* is stenohaline and prefers the stable areas of the bay, where great variations in salinity do not occur (Fig. 2d).

All studied species, exception for *K. dictyon* which is stenohaline, are euryhaline and are good indicators of environment salinity changes.

The presence of *Callistocythere litoralis*, a typical species from temperate and cold waters of Southern Brazil, Uruguay and Argentina, together with warm waters species from the north (*Callistocythere ornata*, *Tanella gracilis*, *Keijella dictyon*), indicates that the southern limit of the Transitional Assemblage that was proposed for Brazilian continental shelf by Coimbra & Ornellas (1989) should be extended to Lat. 23° S.

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