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CYPRIDEIS SALEBROSA HARTMANNI RAMIREZ, 1967, A NEW
SUB SPECIES FROM BRASIL AND ARGENTINA

LILIA PINTO DE ORNELLAS*
NORMA LUIZA WÜRDIG**

SINOPSE

É descrita uma espécie, cuja ocorrência se registra pela primeira vez para a área de Tramandaí, Estado do Rio Grande do Sul, Brasil. Ela é idêntica à descrita por Ramirez (1967) como *Cyprideis hartmanni*, posta em sinonímia de *Cyprideis salebrosa van den Bold*, 1963 por Sandberg e Plusquellec (1974). *Cyprideis hartmanni* é emendada e colocada com a espécie aqui descrita como subespécie de *Cyprideis salebrosa*.

ABSTRACT

It is described for the first time a species from the area of Tramandaí, State of Rio Grande do Sul, Brasil. It is identical to that described by Ramirez (1967) as *Cyprideis hartmanni*, which was put by Sandberg and Plusquellec (1974) as a synonymous of *Cyprideis salebrosa van den Bold*, 1963. *Cyprideis hartmanni* is here emended and put together with the species here described as a sub species of *Cyprideis salebrosa*.

INTRODUCTION

The study of living ostracodes associations of the Rio Grande do Sul coastal plain is part of the general researches of the Departamento de Paleontologia e Estratigrafia and now also of the Departamento de Zoologia – Universidade Federal do Rio Grande do Sul. As a partial result of this study a sub species of the mixohaline ostracode *Cyprideis salebrosa* is described as *Cyprideis salebrosa hartmanni* Ramirez, 1967 and its occurrence is registered for the first time in the State of Rio Grande do Sul, Southern Brasil.

The purpose of this work is the taxonomic and ecologic study of the fauna to reach paleoecological, paleogeographical and stratigraphical interpretations.

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GEOGRAPHIC POSITION AND ECOLOGICAL DATA OF THE AREA

The recent mixohaline ostracode *Cyprideis salebrosa hartmanni* here described is found in Armazém Lagoon, at Tramandaí area (lat. 29° 59' S; long. 50° 08' W). More data about collecting locality (T-27) were pointed out in Ornellas (1974).

The ostracodes were collected at the lagoon border with a planktonic net dragged on the botton. This lagoon is largely associated to Tramandaí Lagoon, which is linked to the ocean through a channel of about 1500m. Thus Armazém Lagoon presents also a mixohaline environment, with large salinity variation. This salinity often ranges from 0‰ to 29‰. In T-27 the depth of water normally ranges from 10 to 40cm, but sometimes it temporally dries being the botton exposed. The botton is constituted by muddy sand, rich in organic remains. In the sampling days the temperature ranges from 15°C to 25°C. The mainly marginal vegetation is constituted by cyperaceas. The other species registered for this locality are *Minicythere heinii* Ornellas, 1974; *Perissocytheridea kroemmelbeini* Pinto & Ornellas, 1970; *Cyprideis riograndensis* Pinto & Ornellas, 1965 and *Cytherura purperae* Ornelas & Fallavena, 1978.

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SYSTEMATIC DESCRIPTION

Phylum	Arthropoda
Classis	Crustacea
Sub-Classis	Ostracoda
Ordo	Podocopida
Sub-Ordo	Podocopina
Super-Familia	Cytheracea Baird, 1850
Familia	Cytherideidae Sars, 1925
Sub-Familia	Cytherideinae Sars, 1925

GENUS CYPRIDEIS JONES, 1857

DIAGNOSIS

Carapace oval-reniform in lateral outline, great height, slightly greater than half the lenght. Dorsal and ventral margins almost parallel; dorsal margin slightly

concave in anterior half. Anterior end rounded, posterior end obtusely rounded. Seen dorsally ovoid wider posteriorly. Surface with scattered tubercles on the type species, normally smooth with a light sulcus just anterior to middle length, sometimes anterior with or without marginal denticles, spurs present or not at the postero-ventral or anterior-ventral side. Duplicature narrow, the inner margin and line of concrescence coincident; porecanals numerous, some simple straight, others bifurcating. Hinge with four elements; at the left valve an elongate coarsely crenulate anterior socket with about 15 pits followed by the antero-median element a short finely crenulate projecting bar, merging shallow furrow finely crenulate and short coarsely crenulate socket with about 6 pits. Muscle scars in vertical row of four adductors; one rounded and a V-shaped antennal scar in front of top row; one mandibular scar in front of bottom of row and the second one near ventral margin.

Eyes distinctly separated. Antennulae robust, antennae slender and provided with 2 apical claws. Legs of right side in male conspicuously transformed, being the second leg atrophied. Caudal rami extremely small in form of 2 thin plumose setae. Ripe ova received within the shell-cavity for further development.

Type-species: *Candona torosa* Jones, 1850

CYPRIDEIS SALEBROSA VAN DEN BOLD, 1963

Cythere americana Sharpe, 108, (part), U. S. Nat. Mus., Proc., v. 35, p.420-421.

Cyprideis locketti (Stephenson), Swain, 1955, (part), p. 615; pl. 59, figs. 10a-c (not pl. 64, fig. 13 = *Cyprideis castus* Benson).

Cyprideis torosa (Jones), Swain, 1955, p. 616-617; pl. 59, figs. 8a-b; text-fig. 32c.

Cyprideis littoralis (Brady), Byrne, LeRoy & Riley, 1959, p. 241; pl. 4, fig. 11; pl. 5, fig. 12; pl. 6, fig. 14.

Cyprideis n. sp. — LeRoy. In: Byrne, LeRoy & Riley, 1959, p. 240-241; pl. 6, fig. 10.

Cyprideis n. sp. — LeRoy. In: Byrne, LeRoy, & Riley, 1959, p. 240-241; pl. 6, fig. 11.

Cyprideis littoralis Brady, Gutentag & Benson, 1962, p. 47, 49, 50; pl. 2, figs. 4-7; text-fig. 14a-d.

Cyprideis salebrosa n. sp. van den Bold, 1963, p. 377-378; pl. 7, figs. 9a-c; pl. 11, figs. 1a-c.

Cyprideis gigantea LeRoy, 1964. Jour. Paleont., v.38, p. 1059; pl. 170, figs. 1a-e, 2a-f, 3a-c.

DIAGNOSIS

Carapace with quadrangular valves. Anterior end evenly rounded without denticulation; dorsal margin gently arched; posterior end truncate, steeply in the female and obliquely in the male, rounded below; ventral margin slightly sinuate in the female and with a strong bulge downward in the posterior half in the male, small circular to oval normal pore canal openings; asymmetrical upper mandibular scar.

Cyprideis salebrosa hartmanni Ramirez, 1967, emend.
Ornellas & Würdig, subsp. nov.

Cyprideis hartmanni Ramirez, 1967

p. 40, 42; pl. 11, fig. 74-79; pl. 12, fig. 80-89

Hypotypus: Female MP, UFRGS, n^o MP-0-794

Male MP, UFRGS, n^o MP-0-795

Locus: Muddy sand margin of the Armazém Lagoon in Tramandaí, State of Rio Grande do Sul, Brasil.

DIAGNOSIS

The male presents second right thoracic leg with strong, short, annulated and pilose setae at the dorso-distal end of the first article.

DESCRIPTION

THE FEMALE CARAPACE (Pl. I, fig. 1-10)

Carapace quadrangular in lateral view with the greatest height at the mid-length. Dorsal margin pronounced convex with a slight sinuosity in the first quarter and a neatly posterior cardinal angle especially in the left valve; anterior border broad and evenly rounded; ventral margin slightly sinuate, forming small concavity in front of the middle; the posterior end of the left valve is truncate above and rounded angular below. Surface of the valves punctate, with a slightly lateral oblique sulcus in front of the middle. It presents a clear tendency to develop spiniform at the dorso and ventro-lateral posterior areas, especially well developed in young instars. In dorsal view carapace inflated, ovoid, elongate with the greatest width at the posterior third, tapering to form the anterior extremity that ends in almost acute angle, posterior end rounded.

MALE CARAPACE (Pl. II, fig. 1-8)

It presents a strong sexual dimorphism. The male carapace differs from the female by the following characteristics: it is greater, longer and oval in lateral view; dorsal margin more arched, with a pronounced postero-dorsal slope and consequently with a narrower posterior end, posterior border obliquely truncate; ventral margin neatly sinuate, presenting a strong bulged in the posterior half. In dorsal view it is oval elongate with the greatest width at the mid-length; posterior and anterior ends tapering.

SOFT PARTS OF THE FEMALE (Pl. III, fig. 1-3; Pl. IV, fig. 1-5)

Antennulae: (Pl. III, fig. 1)

Penta articulated, with longer rather than wider articles except the third one. The basal article presents a group of short hairs in the dorso-distal corner. Second article with four tufts of long hairs: two in centro-dorsal position, one in the middle of the ventral portion and the last one laterally, near the middle of the ventral portion. Also, there is a group of short hairs in the dorso-distal corner and a long ventro-distal annulated and haired seta, that is slightly longer than the last three articles. Third article with a dorso-ventral haired claw, which is slightly longer than the two last articles. The fourth article presents alternately at the dorso-distal portion, two long and smooth setae and two strong and slightly shorter claws. These claws have the two dorso-distal thirds furnished with a series of short hairs. There are two lateral short setae, one central and another distal. This article also, presents a dorso-distal row of short hairs. Fifth article with two distal setae, one simple and finally haired and another one bifid, where the club-shaped branch is about half of the other one.

Antennae: (Pl. III, fig. 2)

Tetra articulated, with longer rather than wider articles except the second one. First article with a dorso-central tuft of long hairs. Attached at the dorso-distal end there is a long and tripartite natatory seta that surpasses the last article. The second article is short and presents two group of hairs: one in latero-median position and the other one in dorso-basal position. It also presents a ventro-distal haired seta longer than the two thirds of the third article. Third article with one strong and haired claw and two setae on the last third of the ventral side, one of which is slightly haired and the other club-shaped. At the same level, on the dorsal side, there are two slender setae: the larger one surpasses the last article and is three times longer than the shorter one. On the ventro-distal corner of this article there is one haired strong claw, with about two thirds of the length of the claw of the last article. The fourth article has two strong and ventrally haired claws.

Mandibles: (Pl. IV, fig. 2)

The protopodite carries at its free end a series of six trilobed teeth and two smaller spiniform ones. The size of the teeth decreases from the distal to the proximal end. There are three spiniform setae; two of them between the first and second teeth and the other one between the second and third teeth. The series of teeth ends by a thin and short seta. At the dorsal side of the free end of the protopodite there is a little thick haired seta. The second podomere of the protopodite is stronger and wider than the others. It presents a centro-dorsal mandibular plate with four finely plumose branchial setae and a little smooth and chitinized hook turned down. The two proximal setae are long, the third one of the middle size and the distal one is short. This article also has a centro-ventral long seta with haired distal half which reaches the last article of the palp. The first article of the palp presents at the middle of the dorsal side an annulated and slightly haired seta that surpasses the length of the third article. At the dorso-distal end it is found a series of setae, almost of the same size. The first two are annulated and haired and the other five are finally pilose. This article also presents at the ventro-distal end a long and smooth seta and two haired long bristles. The seta surpasses the terminal claws of the last article and the two bristles are slightly longer than the third article. The second article presents on the ventro-distal end two setae and one bristle. The bristle is pilose and almost three times the length of the next article. The larger seta is smooth and slightly longer than the claws of the third article, the shortest one is slender. The third article presents three smooth claws, two long, of the same size, and a central shorter.

Maxillae: (Pl. III, fig. 3)

The masticatory lobes have each one several setae at the free end. The outer masticatory process has eight setae; the first one with a tuft of hairs at the middle portion. The maxillary palp is formed by two articles, the proximal one presents at the dorso-distal end four annulated and haired setae of the same size. The second article has on the ventro-proximal portion a pilose seta as long as one-and-a-half the length of this article. At the distal portion there are three setae, being the central one shorter. The outer seta has a dorso-central delicate hairs. The branchial plate carries seventeen plumose setae, being the first and the last two ones, the smallest.

The first pair of thoracic legs: (Pl. IV, fig. 1)

The first thoracic legs are the smallest ones and tetra articulated. The distal end of all articles are pilose. The basal article is the strongest and the longest one. The second article is slender and a little longer than one third of the length of the basal podomere. The third and fourth articles decrease in size. The basal article has

a ventro-proximal long and annulated seta furnished with silky and long hairs. The dorso-central portion presents a long pilose and annulated seta and at the dorso-distal end two annulated haired setae, almost with the same size of the second article. The second article with a dorso-distal slightly haired seta, which surpasses a little the last podomere. Dorsal side of the second, third and fourth articles with some scattered hairs. Last podomere with a distal long, strong and curved claw, almost two times longer than the last article.

The second pair of thoracic legs: (Pl. IV, fig. 3)

The second thoracic legs are tetra articulated. The basal article is the strongest and the longest one. The second article is narrower and slightly shorter than the first one and the other two are slightly shorter than the third article. The basal article has two dorsal annulated haired slender setae: the central one is longer and almost two thirds of the length of the article and the shorter one as long as a half of the article length. At the basal ventral side there is a long strong and annulated seta furnished with silky and long hairs. This seta surpasses slightly the length of the basal article. The second article with a dorso-distal haired seta which surpasses a little the length of the third podomere. At the dorsal side there is some bundles of long hairs. Third article with a ring of short and silky hairs at the distal end. The last article with a distal very long curved claw, surrounded at the basis by a ring of silky and short hairs.

The third pair of thoracic legs. (Pl. IV, fig. 4)

The third thoracic legs are tetra articulated, the two first articles almost with the same size, but the second one is narrower. The third and fourth articles have the same size and represents two thirds of the length of the two first articles. The basal article has two dorsal long, annulated and haired setae: one in the second third of the podomere and other one at the distal end. At the ventro-proximal side there is another very long and haired annulated seta. The second article presents at the dorso-distal side a long and haired seta, that reaches the end of the last article and another little spiniform one. The second, third and fourth articles with a ring of short hairs at the distal end. The last article has a very long, slightly curved claw, with the distal half furnished with silky an short hairs.

Caudal rami: (Pl. IV, fig. 5)

Behind the genial lobes there are the furcae on each side represented by the pilose setae. In the back of the furcae, in a central position, there is an unpaired protuberance furnished with silky hairs and a central small haired bristle.

Soft parts of the male: (Pl. V, fig. 1-3; Pl. VI, fig. 1-6; Pl. VII, fig. 16)

The Antennulae, Antennae, Mandibles and Maxillae present the same general characteristics ascribed to the female, being thinner.

First pair of thoracic legs: (Pl. VI, fig. 4-5)

The right first thoracic leg differs from the left one by having longer and wider articles. The three last articles are as wide as two thirds of the length of them. First article with the ventro-proximal and dorso-distal setae longer than two thirds of the length of the basal article. Dorso distal seta of the second article reaching the mid-length of the terminal claw. The last article with the terminal claw thicker and shorter than that of the left leg.

Left second thoracic leg: (Pl. VI, fig. 6)

The left second thoracic leg differs from the female by having longer and wider articles. The first article with the setae a little shorter than those of the female. The dorso distal one very strong and short with longer hairs. Last article with the terminal claw stronger than that of the female.

Right second thoracic leg: (Pl. VII, fig. 1-2)

The right second thoracic leg is atrophied. The basal article is the most developed. It presents two dorsal annulated setae; one slender haired, in almost central position and another strong, very short and garnished with silky and long hairs. There is also a ventro-basal seta, annulated, strong with long hairs like the females. The other five articles are narrower and shorter. The second article joins the third one through a well developed and quite flexible articulation. Both have the same size, two thirds of the length of the fourth article. The fourth article presents an inconspicuous division, being the basal part longer than the distal one. The fifth and sixth articles are the shortest. The last one has an atrophied, very small claw at the distal end.

The third pair of thoracic legs: (Pl. VII, fig. 5)

The third pair of thoracic legs differs from the legs of the female because it has longer and wider articles and slightly longer hairs. The basal article presents the dorso-distal seta shorter, thicker and more pilose than the female. The second article with four tufts of long hairs at the dorsal side and the distal seta surpassing the last article. The fifth article with longer and almost straight claw.

Brush-shaped organ: (Pl. VI, fig. 1)

The brush-shaped organ is small appendage, about three to four times longer than wide, placed between the first pair of legs. This appendage has a chitinized basis and two cylindrical branches, each one with a slanting row of short and fine hairs at its distal third and a tuft of long and silky hairs at its distal end.

Copulative appendages: (Pl. VII, fig. 6)

The copulative appendages have the basal part sub quadrate in shape, very large and tumid. At the junction with the terminal part it presents a highly chitinized rodlike process pointing forward. Terminal part not sharply defined from the basal one and of somewhat triangular shape. On the posterior distal portion of the body between the two basal parts of the copulative appendages there is a little and unpaired short bristle (Pl. VI, fig. 4)

Dimensions —

Hypotypes: A female carapace, MP — UFRGS; Nº MP-0-794.
Length: right valve 0.936mm; left valve 0.956mm.
A male carapace, MP— UFRGS, nº MP-0-795.
Length: right valve 1.066mm; left valve 1.086mm.

Remarks — The carapace and the soft parts morphology of the species here described is very similar to *Cyprideis salebrosa* van den Bold. But the specimens from Armazém Lagoon present a short, strong, annulated and pilose seta at the dorso-distal end of the first article of the right second male leg. This feature is also observed in the species from Argentina described by Ramirez (1967) as *Cyprideis hartmanni*. By the presence of this feature both differ from that one found at the Northern Hemisphere (Pl. VII, fig. 1-3). For this reason the present authors designed the species from South America as a sub species of *Cyprideis salebrosa*: *Cyprideis salebrosa hartmanni* Ramirez, 1967.

Occurrence — In Brasil, Rio Grande do Sul, Tramandaí, at locality T-27 in a muddy sand margin of the Armazém Lagoon and in Argentina at the Province of Buenos Aires lagoons.

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PLATE I

Cyprideis salebrosa hartmanni Ramirez, 1967, emend, Ornellas & Würdig, subsp. nov.

Female. Hypotype MP, UFRGS, n^o MP-0-794

- Fig. 1 — Right valve — lateral view.
 Fig. 2 — Left valve — lateral view.
 Fig. 3 — Carapace — dorsal view.
 Fig. 4 — Detail of the hinge left valve.

- Fig. 5 — Detail of the muscle scars.
 Fig. 6 — Detail of the posterior margin of left valve.
 Fig. 7 — Detail of the anterior margin of right valve.
 Fig. 8 — Detail of the posterior margin of right valve.
 Fig. 9 — Detail of the hinge of left valve.
 Fig. 10 — Detail of the hinge of right valve.

PLATE II

Cyprideis salebrosa hartmanni Ramirez, 1967, emend. Ornellas & Würdig, subsp. nov.

Male. Hypotype MP, UFRGS, n^o MP-0-795

- Fig. 1 — Right valve — lateral view.
 Fig. 2 — Left valve — lateral view.
 Fig. 3 — Detail of the muscle scars.
 Fig. 4 — Detail of the posterior margin of right valve.
 Fig. 5 — Detail of the hinge of left valve.
 Fig. 6 — Detail of the posterior margin of left valve.
 Fig. 7 — Detail of the anterior margin of left valve.
 Fig. 8 — Carapace — dorsal view.

PLATE III

Cyprides salebrosa hartmanni Ramirez, 1967, emend. Ornellas & Würdig, subsp. nov.

Female. Hypotype MP, UFRGS, n^o MP-0-794

- Fig. 1 — Right antennula.
 Fig. 2 — Left antenna.
 Fig. 3 — Left maxilla.

PLATE IV

Cyprides salebrosa hartmanni Ramirez, 1967, emend. Ornellas & Würdig subsp. nov.

Female. Hypotype MP, UFRGS, n^o MP-0-794

- Fig. 1 — Left first thoracic leg.
 Fig. 2 — Left mandible.
 Fig. 3 — Right second thoracic leg.
 Fig. 4 — Left third thoracic leg.
 Fig. 5 — Caudal rami.

PLATE V

Cyprideis salebrosa hartmanni Ramirez, 1967, emend. Ornellas & Würdig subsp. nov.

Male. Hypotype MP, UFRGS, n^o MP-0-795

- Fig. 1 — Right antennula.
 Fig. 2 — Left antenna.
 Fig. 3 — Right maxilla.

PLATE VI

Cyprideis salebrosa hartmanni Ramirez, 1967, emend. Ornellas & Würdig subsp. nov.

Male. Hypotype MP, UFRGS, n^o MP-0-795

- Fig. 1 — Brush-shaped organ.
Fig. 2 — Right mandible.
Fig. 3 — Detail of the right mandible.
Fig. 4 — Right first thoracic leg.
Fig. 5 — Left first thoracic leg.
Fig. 6 — Left second thoracic leg.

PLATE VII

Cyprideis salebrosa hartmanni Ramirez, 1967, emend. Ornellas & Würdig subsp. nov.

Male. Hypotype MP, UFRGS, n^o MP-0-795

- Fig. 1 — Right second thoracic leg.
Fig. 2 — Detail of the right second thoracic leg.

Cyprideis salebrosa van den Bold, 1963

Male. Plesiotype MP, UFRGS, n^o MP-0-912, From Texas Gulf Coast, American Canal, USA.

- Fig. 3 — Right second thoracic leg.

Cyprideis salebrosa hartmanni Ramirez, 1967, emend. Ornellas & Würdig subsp. nov.

Male. Hypotype MP, UFRGS, n^o MP-0-795

- Fig. 4 — Terminal bristle of the body.
Fig. 5 — Left third thoracic leg.
Fig. 6 — Left copulative appendage.