

## TWO NEW SPECIES OF *CASTALIA* (MOLLUSCA, BIVALVIA, UNIONOIDA) IN CRETACEOUS OF BAURU GROUP, SÃO PAULO STATE, BRAZIL

### *DUAS NOVAS ESPÉCIES DE CASTALIA (MOLLUSCA, BIVALVIA, UNIONOIDA) NO CRETÁCEO DO GRUPO BAURU, SÃO PAULO, BRASIL*

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**Resumo:** Duas novas espécies de *Castalia* (Bivalvia, Unionoidea, Hyriidae), *Castalia cretacea* n. sp. e *C. minuta* n. sp. são descritas para moldes cretáceos provenientes de sedimentos do Grupo Bauru (Senoniano), Formação Adamantina, São Paulo, Brasil.

**Palavras-chave:** Cretáceo, Grupo Bauru, *Castalia cretacea* n. sp., *Castalia minuta* n. sp., Bivalvia, Unionoidea, Brasil.

**Abstract:** Two fossil species of *Castalia* (Bivalvia, Unionoidea, Hyriidae), *Castalia cretacea* n. sp. and *C. minuta* n. sp. are described from Cretaceous casts, from São Paulo State, Brazil, Bauru Group (Senonian), Adamantina Formation sediments.

**Keywords:** Cretaceous, Bauru Group, *Castalia cretacea* n. sp., *Castalia minuta* n. sp., Bivalvia, Unionoidea, Brazil.

#### INTRODUCTION

Mezzalira (1974) described the invertebrate fauna from the Bauru Group (Senonian, Cretaceous) sediments, providing full historic comments and descriptions of several invertebrate taxa. Some horizons of the Bauru Group show a bivalve fauna similar to that occurring in Recent drainage rivers and lakes. In terms of genera most are the same.

Analyzes of additional material has propitiated complementary papers and communications (Mezzalira & Simone 1991; Simone & Mezzalira 1993, 1994, 1997). The present paper, which is a continuation of those contributions, refers to the genus *Castalia* Lamarck 1819 (Bivalvia, Unionoidea, Hyriidae), only recently referred to this age (Mezzalira & Simone 1991; Ferreira & Alvarenga 1993). This paper brings the formal description of two new species.

#### SYSTEMATICS

**Types:** Holotype: "Instituto Geológico" (IG) of the "Secretaria Estadual do Meio Ambiente do Estado de São Paulo" IG 1028-I, cast. Paratypes: IG 1027-I (from type-locality); IG 1030-I and IG 1031-I, 2 casts, Flórida Paulista city, km 16 of railway FEPASA Adamantina-Pacaembu, São Paulo.

**Type-locality:** Pacaembu district, near downtown, São Paulo, Brazil.

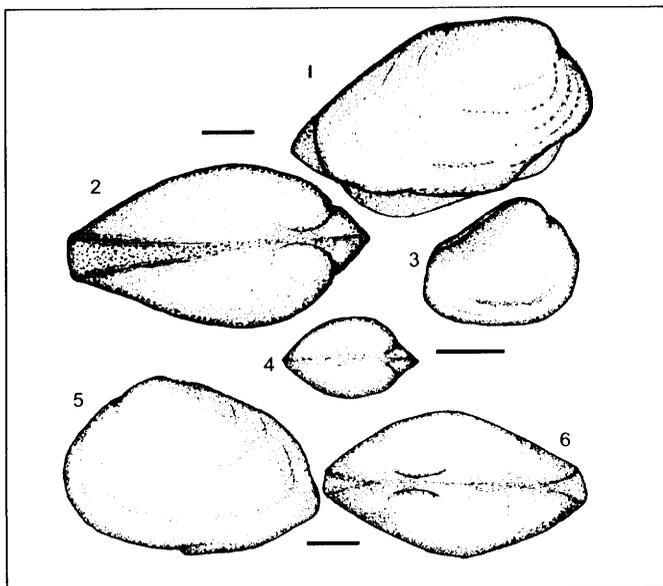
**Diagnosis:** Senonian *Castalia* with umbo sub-central and somewhat broad; suddenly descendant posterior margin; region between posterior and ventral margins angular.

**Description:** Shell large (up to 54.3 mm), equivalve, obese, sub-central to anterior beaks, low angular posterior umbonal carina. Umbos rather high, prosogyral and broad. Anterior margin ample and rounded. Ventral margin convex. Posterior margin concave or straight in smaller specimens and convex in larger ones, suddenly descendant, angular with ventral margin. Dorsal

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*Castalia cretacea* n. sp.



FIGURES 1 to 6 - *Castalia cretacea* n. sp. casts. Figures 1 and 2: right and dorsal view of holotype (IG 1028-I); Figure 3: right view of paratype (IG 1031-I); Figure 4: dorsal view of paratype (IG 1030-I); Figures 5 and 6: left and dorsal view of the paratype (IG 1027-I). Scales = 10 mm. FIGURAS 1 a 6 - *Castalia cretacea* n. sp. moldes: Figuras 1 e 2: vistas direita e dorsal do holótipo (IG 1028-I); Figura 3: vista direita do parátipo (IG 1031-I); Figura 4: vista dorsal do parátipo (IG 1030-I); Figuras 5 e 6: vistas esquerda e dorsal do parátipo (IG 1027-I). Escala = 10 mm.

margin convex, with a discreet concavity anterior to beaks. Valves smooth except for concentric undulations. Hinge not preserved. Anterior adductor muscle scar rounded.

**Measurements** (in mm). Holotype, length: 54.3; height: 40.0; width: 31.0. Paratypes: (IG 1027-I), 51,6 by 37,6 by 27,2; (IG 1030-I), 20.3 by 18.0 by 12.0; (IG-1031-I) 25.0 by 19.5 by 14.4.

**Horizon:** Senonian, Cretaceous; Bauru Group, Adamantina Formation.

**Etymology:** The specific name refers to the stratigraphic occurrence (Cretaceous).

**Remarks:** The four specimens are double-valved casts, of pale-cream sandstone. The small specimens (IG 1030-I and 1031-I) (Figures 3-4), differ from the holotype (Figures 1-2), by their concave posterior-dorsal margin; and the specimen IG 1027-I (Figures 5-6) has low umbos. Such differences were interpreted as intra-specific variations, due probably to growth and compaction of the matrix.

*Castalia minuta* n. sp.

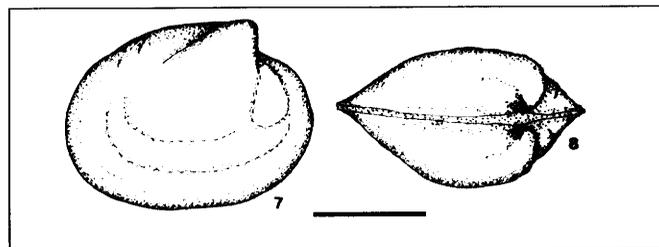
**Types:** Holotype: IG 1026-I, cast; Paratype IG 1029-I (1 cast) both from the type-locality.

**Type-locality:** Alvares Machado district, km 576 of the Presidente Prudente - Presidente Epitácio road, São Paulo, Brazil.

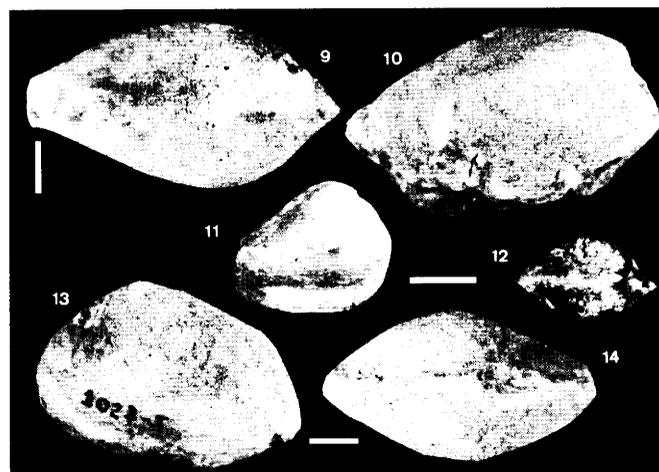
**Diagnosis:** Senonian *Castalia* of small size; umbones pointed and anterior; anterior dorsal margin with a large concavity anterior to the beaks; posterior margin convex and somewhat tall; confluence between posterior and ventral margins rounded.

**Description:** Shell small (to 28 mm), equivalve, obese, beaks in anterior third of valve, low posterior umbonal carina. Umbo somewhat high, prosogyral and pointed. Anterior and ventral margins ample and rounded. Posterior margin tall, convex

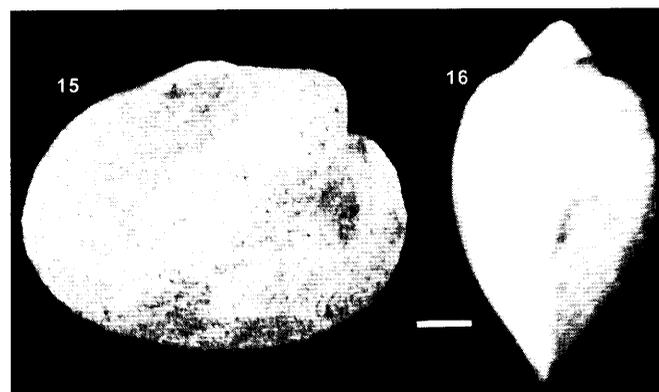
and softly descendant, rounded limit with ventral margin. Dorsal margin convex, with strong concavity anterior to beaks. Valves smooth except for growth lines. Hinge not preserved. Anterior adductor muscle scar rounded.



FIGURES 7 and 8 - *Castalia minuta* n. sp. casts. Figure 7: right view of holotype (IG 1026-I); Figure 8: dorsal view of the same. Scale = 10 mm. FIGURAS 7 e 8 - *Castalia minuta* n. sp. moldes: Figura 7: vistas direita do holótipo (IG 1026-I); Figura 8: vista dorsal do mesmo. Escala = 10 mm.



FIGURES 9-14 - *Castalia cretacea* n. sp. casts, photos. Figures 9 and 10: dorsal and right view of holotype (IG-1028-I); Figure 11: paratype (IG-1031-I), right view; Figure 12: paratype (IG-1030-I), dorsal view; Figures 13 and 14: paratype (IG-1027-I), left and dorsal views. Scales = 10 mm. FIGURAS 9-14 - *Castalia cretacea* n. sp. moldes, fotos: Figuras 9 e 10: vistas dorsal e direita do holótipo (IG-1028-I); Figura 11: parátipo (IG-1031-I), vista direita; Figura 12: parátipo (IG-1030-I), vista dorsal; Figuras 13 e 14: parátipo (IG-1027-I), vistas esquerda e dorsal. Escala = 10 mm.



FIGURES 15 and 16 - *Castalia minuta* n. sp. casts of holotype (IG-1026-I), right and dorsal views. Scale = 3 mm. FIGURAS 15 e 16 - *Castalia minuta* sp. n. molde do holótipo (IG-1026-I), vistas direita e dorsal. Escala = 3 mm.

**Measurements** (in mm). IG 1026-I: length: 28.0; height: 25.0; width: 17.6.

**Horizon:** Senonian, Cretaceous; Bauru Group, Adamantina Formation.

**Etymology.** The specific name refers to small size of the specimens.

**Remarks:** Both specimens are casts of a beige sandstone; the specimen IG 1029-I is an incomplete cast of the right valve, with outer sculpture visible; the holotype is double-valved, without outer sculpture preserved.

## DISCUSSION

Up to now only Ferreira & Alvarenga (1993) had cited *Castalia* from the Mid-Albian - Lower-Cenomanian, Cretaceous, Itapecuru Formation, revealing the presence of the genus since the lower Cretaceous. The species described here are from the upper Cretaceous.

*Castalia minuta* differs from *C. cretacea* in having smaller size; umbo more anteriorized and pointed; dorsal posterior margin taller; and confluence between posterior and ventral margins rounded (not angular). From the eight valid Recent species of *Castalia*, both species described herein are more similar to *C. undosa* Martens 1885, from which both differ mainly by the more rounded outline. *C. undosa* occurs in same geographic region than fossil species.

Stratigraphic and paleoenvironmental studies in horizons of these species are still under analysis. Apparently paleoenvironmental conditions differ from place to place, as shown by the characters of the several fossiliferous deposits of the Bauru Group (Mezzalira 1974).

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