A PYCNODONT DENTITION (*PARAMICRODON VOLCANENSIS* N. SP.; PISCES, ACTINOPTERYGII) FROM THE LOWER CRETACEOUS OF EL VOLCAN REGION, SOUTHEAST OF SANTIAGO, CHILE

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RESUMEN

Se describe una dentición prearticular, que se asigna a *Paramicrodon volcanensis* nov. sp. Esta proviene del Cretácico Inferior (probablemente Neocomiano Inferior) de la región de El Volcán, al sureste de Santiago de Chile. Este es el primer hallazgo de vertebrados fósiles que se describe para estos depósitos.

La dentición prearticular presenta similitudes con la dentición de otras especies de *Paramicrodon* en los aspectos siguientes: 1) presencia de tres hileras de dientes (una hilera principal y dos laterales); 2) en sentido lingual-lateral, los dientes de la hilera principal son alargados, pero el alargamiento es menor que en *Proscinetes* (=*Microdon*); 3) en sentido antero-posterior, los dientes de la primera hilera lateral son pequeños (y aún más pequeños que en *Proscinetes*); 4) los dientes de la segunda hilera lateral son alargados, pero no tanto como en *Proscinetes*; 5) ambas hileras laterales tienen igual número de dientes y éstos son más numerosos que en la hilera principal.

Biese (1958) describió un fragmento de un prearticular de un picnodonte y parte de su dentición; éste provenía del Cretácico Inferior (Barremiano-Aptiano inferior) de una localidad al sur de Copiapó, Chile, y fue nominado *Microdon chilensis*. Considerando la descripción y figuras de este autor y mis observaciones sobre este material, asigno este especimen al género *Paramicrodon* de acuerdo a los caracteres diagnósticos presentados por Thurmond (1974).

Finalmente, el género de peces Pycnodontiformes, *Paramicrodon*, está representado, hasta el momento, por dos fragmentos procedentes del Cretácico Inferior de Chile, y numerosos fragmentos del Cretácico Inferior de Texas, U.S.A.

Palabras claves: Pisces, Actinopterygii, Sistemática, Cretácico Inferior, Chile.

ABSTRACT

A pycnodont prearticular dentition (*Paramicrodon volcanensis* n. sp.) is described from the Lower Cretaceous of the El Volcán region, southeast of Santiago, Chile. It is the first vertebrate fossil found within these Lower Cretaceous series, and the second specimen of *Paramicrodon* within the Lower Cretaceous of Chile.

Key words: Pisces, Actinopterygii, Systematics, Lower Cretaceous, Chile.

INTRODUCTION

The described pycnodont prearticular belongs to the Departamento de Geología of the Universidad de Chile, Santiago. It is the first fish remains found in the Lower Cretaceous rocks (probably from the middle to upper part of the Lo Valdés Formation, Upper Tithonian to Middle Neocomian) of the El Volcán región, Andean range southeast of Santiago, Chile (González, 1963).

A review of all pycnodonts, their morphology, and systematics is on the way (Dr. J. R. Nursall, Edmonton, Canada), but the final publication is not in sight. Thus, the most recent classification of pycnodont dentitions (Thurmond, 1974) is used here. Thurmond (1974) divided the pycnodont dentitions into two groups (*Pycnodus*- and *Gyrodus*-group), and the *Gyrodus*-group into three subgroups (*Gyrodus*-, *Palaeobalistum*-, and *Proscinetes*- subgroup).

SYSTEMATICS

Order Pycnodontiformes
Gyrodus-group
Proscinetes-subgroup

Genus *Paramicrodon* Thurmond, 1974

Diagnosis. Prearticular with three tooth rows, one main and two lateral; first lateral row reduced, teeth antero-posteriorly elongated. Vomer with three rows of teeth only, a median, and paired laterals.

Type species. Paramicrodon estesi Thurmond, 1974.

Holotype. SMUSMP 62090 (vomer), Shuler Museum of Paleontology, Southern Methodist University, Dallas, Texas, U.S.A.

Type locality. Paluxy Church Local Fauna, Hood Co., Texas, 32°16′ 25″ N/97°54′ 22″ W.

Type horizon. Travis Peak Formation, Trinity Division, Lower Albian, Lower Cretaceous.

Diagnosis. Paramicrodon prearticular dentition with medio-laterally elongated teeth in the main row (posterior teeth twice as wide as long, anterior teeth 1 1/2 times as wide as long); antero-posteriorly elongated teeth in first lateral row twice as long as wide; teeth of second lateral row subrectangular. All vomerine teeth subrectangular. All teeth with smooth surface.

Paramicrodon chilensis (Biese, 1958)
Plate 1, Fig. 2.

Synonym.

Microdon chilensis Biese, 1958. *Microdon* del Aptiano de Copiapó. Congr. Geol. Inter. México. 20 Ses. p. 235-238 (description).

Holotype. No. 516 Museo Nacional de Historia Natural, Santiago, Chile.

Type locality. 1.100 m NE of Punto E', about 4.400 m ESE of Mine Abundancia in Punta del Cobre, 17 km SE of Copiapó, Chile.

Type horizon. Limestone Pabellón γ, Lower Aptian, Lower Cretaceous.

Diagnosis. Large *Paramicrodon* prearticular dentition with medio-laterally elongated teeth in the main row (posterior teeth twice as wide as long); antero-posteriorly elongated teeth in first lateral row 1 1/2 times as wide as long; nearly circular teeth in second lateral row; surface of all teeth completely smooth.

Paramicrodon volcanensis n. sp.
Fig. 1a, b; Plate 1, Fig. 1.

Derivatio nominis. After El Volcán, the region within the Andean range southeast of Santiago, where the specimen have been found.

Holotype. No. T 160, Departamento de Geología, Universidad de Chile, Santiago, Chile.

Type locality. El Volcán region, southeast of Santiago, Chile; precise locality unknown.

Type horizon. Lower Cretaceous; probably middle to upper part of the Lo Valdés Formation, Upper Tithonian to Middle Neocomian; precise horizon unknown.

Diagnosis. Large *Paramicrodon* prearticular dentition with medio-laterally elongated teeth in second lateral row; antero-posteriorly elongated teeth in first lateral row twice as long as wide; surface of teeth of main row completely smooth, crown of teeth of lateral rows crenulated.

Description. The prearticular bears three rows of teeth and four isolated teeth (two broken off) lingual to the main row (Pl. 1, Fig. 1), The main row is formed by the largest teeth (nearly 4 times as wide medio-laterally as the teeth of the first lateral row, and as wide as the two lateral rows together); there are 11 oval teeth with completely smooth surface. The first lateral row has nearly double the number of teeth in the main row. In most cases, one tooth of the first lateral row corresponds to one tooth in the main row, with one tooth corresponding to the interdental gap of the main row (Fig. 1a). The last three teeth lie horizontally, while all anterior ones are arranged vertically so that they form a transition from the higher level of the main row to the lower level of the second lateral row (Fig. 1b). The borders of

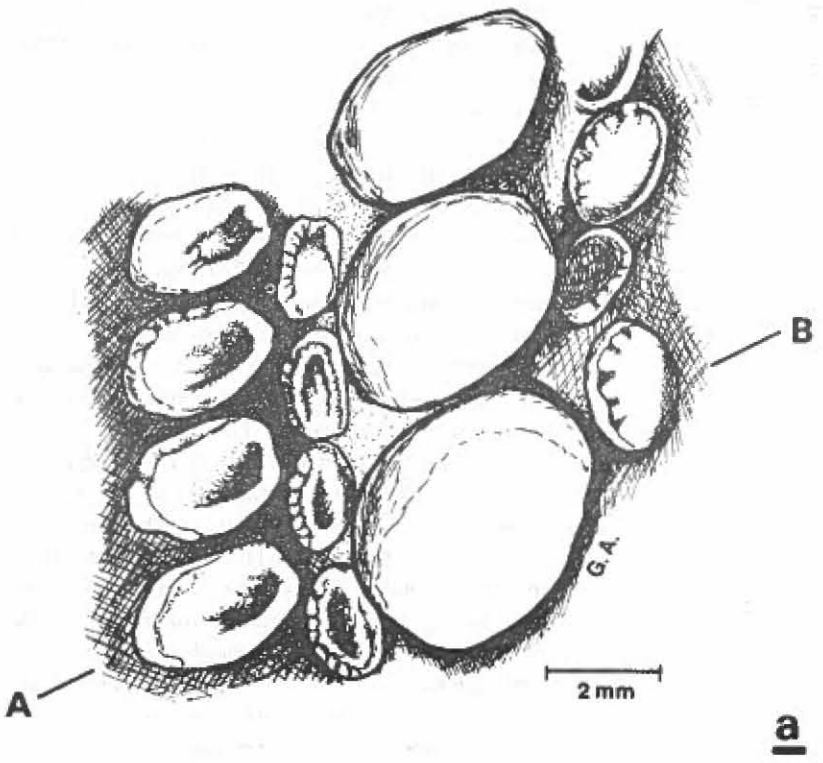

FIG. 1. *Paramicrodon volcanensis* n. sp., left prearticular (No. T 160, Departamento de Geología, Universidad de Chile, Santiago). a. Posterior part of the dentition in dorsal view (8th to 10th tooth of the main row). b. Schematic linguo-lateral section along A-B in a.

the crown of the teeth of the two lateral rows and of the lingual teeth are crenulated (Fig. 1a), best seen on the vertical teeth in the first lateral row. The teeth of the second lateral row are elongated medio-laterally (twice as wide as long) with the axis directed antero-laterally. They alternate with the teeth of the first lateral row so that the number (19) is nearly equal to that of the first lateral row (18). These teeth are worn like the teeth of the main row: the surface is smooth, but the last nine teeth have a shallow central groove.

Measurements: length of the second lateral, the longest tooth row 45,8 mm
maximal width of the three tooth rows 12,8mm
maximal width of the main row (last tooth) 6,3mm
maximal width of the combined lateral rows 6,4 mm

Comparison. New genera and species of pycnodonts are often based entirely on characters of the dentition (see example Thurmond, 1974), even

TABLE 1

COMPARISON OF THE THREE *PARAMICRODON* SPECIES

	Width/length ratio of teeth in main row Posterior	Anterior	Width ratio, main row/lateral rows (combined)	Width ratio of teeth of first lateral row	Shape of teeth of second lateral row	Tooth surface in Main row	Tooth surface in Lateral rows
Paramicrodon estesi	2:1	1,5:1	1,6:1	1:2	subrectangular	smooth	smooth
Paramicrodon chilensis	2:1		1,6:1	1:1,5	circular	smooth	smooth
Paramicrodon volcanensis n. sp.	1:1	1,5:1	1:1	1:2	medio-laterally elongated	smooth crenulated crown	

though the variation of the tooth arrangement is not known in pycnodonts. Consisting of only the prearticular (in most earlier publications called "splenial") dentition, the above described specimen is closest to *Proscinetes* (=*Microdon*) in the relation of the teeth of the main row to those of the two lateral rows. An additional similarity exists in the crenulation on the border of the crown, especially in the small teeth of the first lateral row. Thurmond (1974) erected the new genus *Paramicrodon*, which has less linguo-lateral elongated teeth in the main row; smaller, antero-posteriorly elongated teeth in the first lateral row, and more rounded teeth in the second lateral row compared to *Proscinetes*. The two lateral rows have an equal number of teeth, and more than the main row. The teeth of the first lateral row of *Paramicrodon* are arranged as in the described form: one tooth besides a large tooth of the main row, the second in between two teeth of the main row, and so on. In contrast, the teeth of the second lateral row of the described specimen are linguo-laterally elongated as in *Proscinetes*. On the other hand, only three tooth rows are developped as in *Paramicrodon*, while *Proscinetes* has in most recorded cases four tooth rows on the prearticular. The main difference of the described specimen to *Proscinetes* is in the shape of the teeth of the main row (much more laterally elongated in all *Proscinetes* species) and of the first lateral row (smaller and antero-posteriorly elongated as in *Paramicrodon*).

Proscinetes is known from the Middle Jurassic and the Lower Cretaceous in Europe (Woodward, 1895, 1916), North America (Gidley, 1913; Thurmond, 1974), and South America (Silva-Santos, 1970). *Paramicrodon* has been erected for vomerine and prearticular dentitions from the Lower Cretaceous of Texas (Thurmond, 1974). Thurmond (1974) leaves *Microdon chilensis* Biese, 1958 (Pl. 1, Fig. 2) within ? *Proscinetes*, even though the Lower Cretaceous Chilean form has only three tooth rows, and the teeth of the first lateral row are antero-posteriorly elongated. Taking into account the few characters on the prearticular dentition, the two Chilean forms and the Texan form belong to the genus *Paramicrodon* in which *P. chilensis* and *estesi* have the most laterally elongated teeth in the main row, and the new form the most laterally elongated teeth in the second lateral row. *P. chilensis* resembles very much *P.*

estesi. In contrast to *P. estesi*, the teeth of the first lateral row of *P. chilensis* are not as much elongated, and the teeth of the second lateral row more circular. The new for, *P. volcanensis* n. sp., is quite distinct from both other species by the shape of the teeth in the main and the second lateral row, and by the occurence of crenulation on the crown of the teeth of the lateral rows (Table 1).

Both Chilean *Paramicrodon* species are older than the type species from Texas (Lower Albian); *Paramicrodon volcanensis* n. sp. (probably Lower Neocomian) proceeds *Paramicrodon chilensis* (Lower Aptian), if the stratigraphic assignment of both species is correct.

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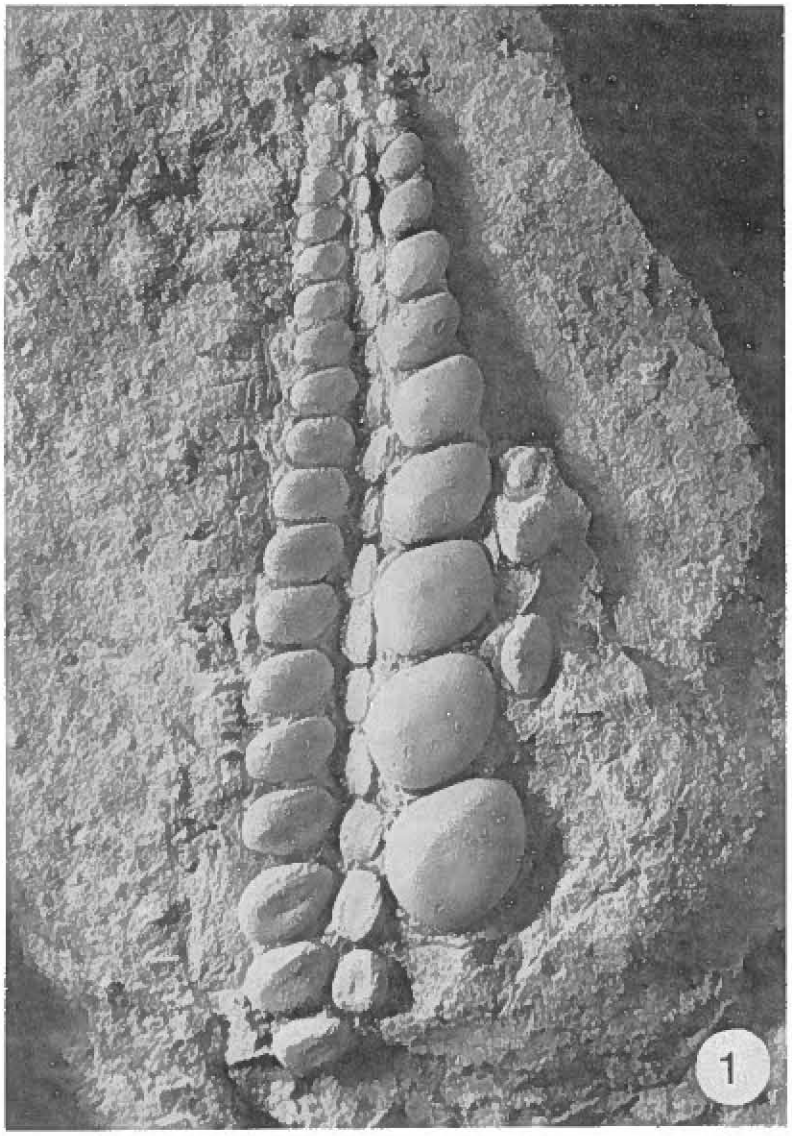
PLATE I

FIG. 1. *Paramicrodon volcanensis* n. sp., left prearticular dentition in dorsal view (specimen No. T 160, Departamento de Geología, Universidad de Chile, Santiago); Lower Cretaceous, El Volcán region, SE of Santiago, Chile. Dusted with NH_4Cl.

FIG. 2. *Paramicrodon chilensis* (Biese, 1958), posterior part of the left prearticular dentition in dorsal view (specimen No. 516, Museo Nacional de Historia Natural, Santiago, Chile); Lower Cretaceous, S of Copiapó, Chile. Dusted with NH_4Cl.

PLATE I



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