

UPPER ORDOVICIAN (SANDBIAN) BRYOZOAN FAUNA FROM ARGENTINE PRECORDILLERA

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ABSTRACT—A stenolemate bryozoan fauna containing 20 species belonging to 18 genera is described from the Las Plantas and Las Aguaditas formations (Upper Ordovician, Sandbian) in San Juan Province, Precordillera of Western Argentina. One genus with one species is new: *Argentinodictya lenticulata* n. gen. n. sp. (Cryptostomata, Ptilodictyina). Four species are new: one trepostome *Parvohallopora parvula* n. sp., two cryptostomes *Trigonodictya parvula* n. sp. and *Ptilodictya intermedia* n. sp., and phylloporinine *Chasmatopora rossae* n. sp. The bryozoan assemblage of the Las Plantas Formation is more diverse than that of the Las Aguaditas Formation. Fourteen species are restricted to the Las Plantas Formation, five species occur in both formations, and one species is restricted to the Las Aguaditas Formation. Erect growth forms are dominant in the studied fauna. The majority of bryozoan taxa display palaeobiogeographic relations to Sandbian–Katian deposits of North America, with two species also known from the Katian of Europe.

INTRODUCTION

THE ORDOVICIAN rocks of the Argentinean Precordillera (Fig. 1) are mainly composed of Lower Ordovician limestones where sponges and brachiopods are the dominant components, and Middle to Upper Ordovician mainly siliciclastic rocks where brachiopods, trilobites, and bryozoans dominate the faunal assemblages (Carrera, 1997). In previous studies on bryozoans from the Ordovician of Argentinean Precordillera, four bryozoan genera were reported from the Lower and Middle Ordovician limestones of Argentinean Precordillera (Carrera, 1995; Carrera and Ernst, 2010), and three genera were reported from the Katian Sassito Formation (Ernst and Carrera, 2008). Bryozoans are particularly diverse and abundant in the Sandbian units, of which the Las Plantas and Las Aguaditas formations are the most characteristic. Material on bryozoans from these formations has been collected during the last 20 yr.

This paper represents a further contribution to the taxonomic study of Ordovician bryozoans from Argentina in order to fill a gap in the bryozoan record from the southern hemisphere. The aim of the present paper is a taxonomic description of 20 bryozoan species belonging to 18 genera from the Las Plantas and Las Aguaditas formations in San Juan Province, Precordillera of western Argentina. This fauna includes one cyclostome, two cystoporate, 10 trepostome, five cryptostome (Ptilodictyina), and two fenestrate (Phylloporinina) species.

GEOLOGICAL SETTING AND STRATIGRAPHY

The Ordovician stratigraphy of the Argentine Precordillera (Fig. 2) includes five depositional sequences (Astini, 1998; Keller et al., 1998; Cañas, 1999) that span the late Tremadoc–Floian–Dapingian (San Juan sequence), Darrivilian (San Juan–Gualcamayo sequence), Sandbian (Las Plantas sequence), Katian (Trapiche sequence), and Hirnantian (Don Braulio sequence). The bryozoan fauna studied in this contribution are mainly concentrated in the Las Plantas sequence.

Sedimentation of the Las Plantas sequence started with the drowning of the underlying carbonate platform (San Juan limestones). In the Darrivilian a rapid eustatic sea-level rise led to the deposition of graptolitic black shales and mudstones. After a sedimentation hiatus, the Sandbian deposits are associated with a different tectono-stratigraphic scenario. Mixed calcareous-siliciclastic sedimentation predominates during the

Sandbian (Las Plantas and Las Aguaditas formations). These deposits also include huge intrabasinal limestone olistoliths mixed with extrabasinal resedimented conglomerates (La Cantera and Las Vacas formations) (Astini, 1995, 1998; Keller et al., 1993).

The overall setting for most of the Middle and Upper Ordovician (late Darrivilian–Katian) can be visualized as a partitioned, block-faulted platform with horst and graben topography (Astini, 1998; Keller et al., 1998). Extensional tectonism produced shallow calcareous or siliciclastic platforms, and local slopes and basin deposits. Predominantly siliciclastic sedimentation continued during the Upper Ordovician, mainly located in the northern part of the basin (Trapiche Formation, Trapiche Sequence of Astini, 1998).

Material for the present study was mainly collected from two localities in the Argentinean Precordillera (Fig. 1) of Upper Ordovician age: the Las Aguaditas creek section near Jáchal city (S 30°18'20", W 68°49'27") and the Gualcamayo River section (S 29°45'00" S, W 68°38'44") near the Guandacol locality. The studied bryozoan fauna comes from the Las Aguaditas and Las Plantas formations. These Sandbian units belong to the Las Plantas sequence (Astini, 1998) that includes in addition the siliciclastic La Cantera and Las Vacas formations.

The Las Aguaditas and Las Plantas formations consist of platy hemipelagic mudstones, peloidal calcisiltites, and rare black shales representing autochthonous facies associations, whereas gravity mass flow deposits with abundant fossil debris dominate both allochthonous and parautochthonous deposits (Astini, 1995, 1998; Keller et al., 1993).

The Las Aguaditas Formation of early Sandbian age (*N. gracilis* biozone) slightly predates the Las Plantas Formation. The Las Aguaditas Formation mainly consists of hemipelagic laminated mudstone deposits, including breccias, megabreccias, and turbidites. These units are interpreted to represent a carbonate margin to foreslope environment (Astini, 1995; Keller et al., 1993). Mudstones and calcisiltites represent the autochthonous sediments that include a fauna of trilobites, ostracods, graptolites, and conodonts. Mixed allochthonous and parautochthonous deposits include calcareous megabreccias with brachiopods, trilobites, receptaculitids, and relatively more abundant bryozoans derived from the upper slope, as well as platform deposits. Specimen distribution among different facies