# STRATIGRAPHIC ANALYSIS OF THE DOMEYKO BASIN, NORTHERN CHILE

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**RESUMEN:** La cuenca Domeyko de Chile Norte (Triasico a Cretacico) corrientemente parace a habia crecedo dentro un "back-arc" activo medio. La llenar de la cuenca es sastrazido pana muchos distintos secencias de caliya y siiciclasticos que paracen a coutenir una responsia stratigraphic relatido a cambios grandes del nivel del mar velativo. La objeto del esto projecto es a utilizer leceucia stratigrafico resolucion-alto cono un herramienta para intrepetir la cronostratifia de un cuenca back-arc activo.

**KEY WORDS:** Domeyko Basin, Jurassic, active back-arc, chronostratigraphy, strike-slip.

## INTRODUCTION

The Triassic to Cretaceous Domeyko Basin of Northern Chile is currently thought to have formed within an active back-arc setting. Positive inversion has concentrated Triassic to Cretaceous outcrop along the N-S trending Domeyko Mountain Belt, with perpendicular valley incision allowing excellent exposure. The Domeyko Range has long been recognised as one of the world's richest mineral provinces but is otherwise relatively unknown.

The Western Fissure Fault System runs N-S through the Domeyko Range and adds the complexity of bedding parallel strike-slip giving juxtaposition of unrelated, time equivalent strata. Some of the earlier work on this area has overlooked the strike-slip component and considered tectonically emplaced strata as being in stratigraphic succession.

## GEOLOGICAL SETTING

The Domeyko Basin is placed within an active back-arc domain because of the distribution of arc related volcanics and high volcanoclastic content. The Jurassic arc trended N-S and was located along the present day position of the Coastal Cordillera. Since Jurassic times the arc has migrated to the east with it's current position on the west side of the Puna (High Andes). Figure 1 shows a generalised Jurassic Palaeogeography with the present day positions of the Jurassic outcrops.

## MESOZOIC STRATIGRAPHY

The basin fill is characterised by a variety of carbonate and siliciclastic sequences with interbedded volcanic and volcanoclastic units. Carbonate and clastic sequences contain a well developed palaeontological evolution with 85% of ammonite biochronozones, exceptions being the Kimmeridgian & Tithonian. From initial fieldwork the Jurassic stratigraphy appears to contain marked stratigraphic responses related to major changes of relative sea-level. For example, the Kimmeridgian is represented by a thick sequence of evaporites (800m), hence giving the loss of palaeontological resolution.

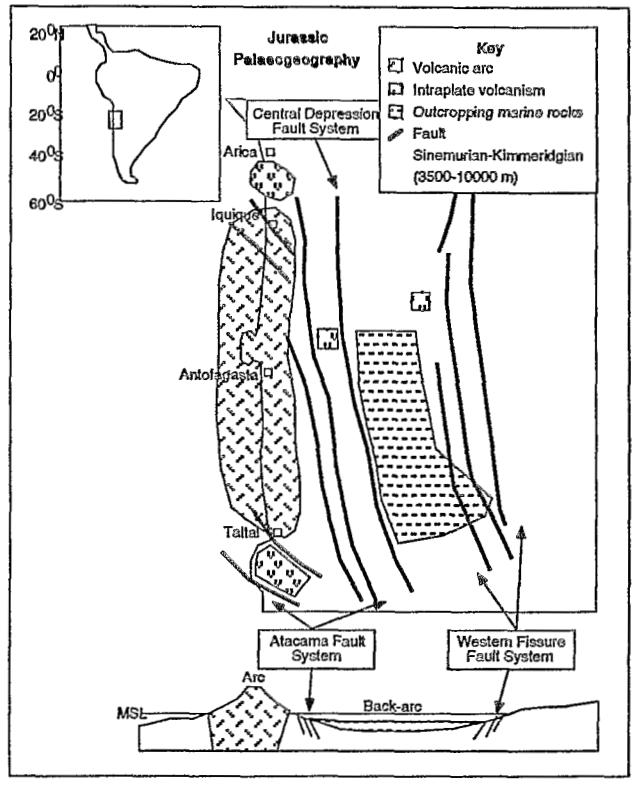


Figure 1: General Jurassic Palaeogeography for Northern Chile.

## TECTONICS

Tectonics are still relatively unknown with the possibility of a subduction related strike-slip component active during basin development. This would possibly explain the formation of small isolated areas of very rapid subsidence. Two currently active major fault systems (Atacama Fault System & Western Fissure Fault System) appear to control the Mesozoic outcrop and are thought to represent the original basin bounding fault systems.

## CONCLUSIONS

Initial work has laid down a provisional outline for Mesozoic basin evolution with current fieldwork being concentrated on detailed facies analysis. The aim of this project is to use high resolution sequence stratigraphy as a tool to develop a more detailed chronostratigraphic framework for the basin's evolution.