ABSTRACT

A succession of stratigraphic units was deposited in the Las Peñas basin in the Salagasta region, Mendoza, Argentina. These strata were deposited from the Andean foreland basin anorched by the main Andean thrust belt. The early synorogenic unit is characterized by a transgressive sequence reflecting a forebulge structure. The second sequence is dominated by a strong Miocene peak reflecting sediments from the Farallones Fm, but lacks any post-Miocene volcanics. The upper sequence is dominated by a late Pleistocene volcanic succession from the Cordillera Principal, indicating tectonic activity during the last glacial period.

PURPOSE

The study aims to constrain the timing and pattern of orogenic exhumation of the Andean system. The stratigraphic and detrital zircon data provide valuable information on the tectonic processes and the timing of these events. The data also help to understand the evolution of the Andean system and its interaction with the subducting Nazca plate.

STRATIGRAPHIC SECTION

Las Peñas Basin, Salagasta Region

1. Triassic Usupallata Group
   - Structurally disrupted section: intercalated conglomerate, sandstone similar to Unit 2, may be upper portion of Unit 3

2. Rio de los Pozos Fm.
   - Unit 3: thick bedded, pebble to boulder polymict clast-supported conglomerate with lesser coarse grained to medium grained lithic arenite, abundant channel features, basal scour (450 m)

3. La Pilona Fm.
   - Unit 2: medium to thick bedded, medium to coarse grained lithic arenite intercalated with gravel to pebble conglomerate, abundant sedimentary structures, distinct coarsening upward succession (250 m)

4. Marino Fm.
   - Unit 1: thin to medium bedded, thick in part, medium to coarse grained lithic arenite, abundant channel features, minor pebble conglomerate and tuff (1315 m)

SYNDEPOSITIONAL VOLCANISM

- The stratigraphic section displays the classic coarsening-upward succession of a rapidly prograding clastic wedge in a retroarc foreland basin.
- The succession consists of: from bottom to top:
  - upper Marino Fm.: medium to coarse grained sandy brecciated fluvial system with distinct tills
  - La Pilona Fm.: transitioned succession consisting of a coarsening-upward sequence of coarse-grained arenitic sandstone and gravel to conglomerate deposited in a brecciated fluvial to alluvial fan system
  - Rio de los Pozos Fm.: pebble to boulder conglomerate unit representing a proximal alluvial fan system

DETRITAL ZIRCON GEOCHRONOLOGY

- This sample is from a well-preserved fluvial sequence of the upper Marino Formation. Note presence of both Grenvillian and Permian populations derived from the Cuyania. The sample is dominated by a major transcontinental volcanic peak attributed to major uplift of the Cordillera Principal. Early Miocene peak may reflect onset of trans-Andean Miocene volcanism are represented by the Las Peñas Formation. Major age 8.5 Ma peak relates to continued synorogenic volcanism.

INTERPRETATIONS

- The stratigraphy of the Las Peñas basin is characterized by a transgressive sequence reflecting a forebulge structure. The second sequence is dominated by a strong Miocene peak reflecting sediments from the Farallones Fm, but lacks any post-Miocene volcanics. The upper sequence is dominated by a late Pleistocene volcanic succession from the Cordillera Principal, indicating tectonic activity during the last glacial period.

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REFERENCES


