

Geophysical Research Abstracts
Vol. 12, EGU2010-11953-1, 2010
EGU General Assembly 2010
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Multiproxy approach revealing climate and cultural changes during the last 26kyrs in south-central Chile

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Multiproxy approach from Purén Lumaco Valley (38°S) describes the paleoenvironmental history during the Last Maximum Glacial (LGM) in south-central Chile.

Three sediment cores and several AMS 14C dates were used to perform a complete pollen, diatoms, chironomids, and sedimentological records demonstrating the existence of a large and non profundal paleolake, between 25 and 20kyr BP.

Some of these evidence are laminated silty-clay sediments (lacustrine rhythmites), associated with the presence of siderite mineral (FeCO₃), besides biological proxies like *Fragilaria construens* and *Stauroforma inermes* (planctonic diatoms), and *Dicrotendipes* sp. and Tanytarsini tribe (littoral chironomids). The pollen ensemble reveals the first glacial refuge of *Araucaria araucana* forests in the low lands during the LGM.

The lake was drained abruptly into a swamp/bog at 12kyr BP and colonized by Myrtaceae wet forest. This evidence suggest the dry/warm climate period of early Holocene in south-central Chile. Later, the sediments indicate variable lacustrine levels, and increase of charcoal particles, associated to current climatic conditions. The pollen spectrum dominated by Myrtaceae and *Nothofagus* contrasts with a strongly disturb current landscape. Actually, Purén-Lumaco valley constitutes a complex peat-bog system dominated by exotic grasses and forest species (*Triticum aestivum*, *Pinus radiata* and *Eucalyptus* spp.).

Some archaeological antecedents in the area document the human development at ca. 7yrs BP. The greatest archaeological characteristic present in the valley is the kuel, a Mapuche earth accumulation. The presence and extension of almost 300 kuel in the valley reflect the social/economic development, and partly explains why the region was the major resistance area for Spanish colonizer during XVI-XVII centuries. Also the archaeological findings reveal the presence of maize pollen (*Zea mays*) within their food consumption.

The influence of climate and human impact in Holocene environments provide a better basis for understanding and managing the present landscape in Araucanian Region. Almost the absence of native forests in the area makes urgent strategies for the recovery and rehabilitation of a relict ecosystem that today represents their regional analog only in the tops of the Chilean Coastal Range.

Acknowledgments: Universidad Austral de Chile (DID 2007-08, FORECOS P04-065-F), BSN-34567-04.