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 (Tritricum 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.

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