



The Late Pleistocene glacial history of the Pralongià plateau (Eastern Dolomites): new insights from Pre-LGM records

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Pre-LGM records are very rarely exposed in high Alpine catchments, having been mostly erased and hidden as a result of the dramatic LGM glacial advance. This study is based on the analysis of stratigraphic data from cores collected by means of eight continuous-coring boreholes ranging in depth from 15 to 25 metres on the formerly glaciated Pralongià plateau (Alta Badia, Eastern Dolomites, Italy). The research was aimed at investigating a deep stratigraphic sequence, not available before in the valley, and analysing new sedimentary records apparently older than the LGM. An essential contribution to the research has been provided by radiocarbon dating on bulk organic sediment found within the cores. The research took also advantage of detailed field surveys aimed at defying the geomorphological framework of the study area. The latter corresponds to the Pralongià plateau exceeding 2000 m in elevation and surrounded by high dolomite peaks up to 3000 m high. Bedrock outcrops on the plateau are alternations of marls, marly limestones and calcarenites ranging in age from Middle to Upper Triassic (San Cassiano and Wengen formations). The eight boreholes were located on the Pralongià plateau, at an altitude between 1910 m and over 1930 m, at “La Brancia” locality.

According to previous authors, during the last glaciation the whole Pralongià plateau was covered by some 100 m-thick ice mass coming from the Pusteria valley. From recent dating of a charcoal sample, it was inferred that the investigated area was in ice-free conditions since at least 16 ka cal BP.

On the plateau, scattered glacial deposits ascribable to the LGM were identified from detailed geomorphological field surveys. As witnesses of glacial transport and accumulation, allochthonous dolomite blocks – from metric to sub-metric dimensions, rounded to sub-rounded in shape – cover the plateau, as well as glacial deposits including some pebbles of different lithotypes not outcropping in the study area (e.g. Rosso Ammonitico and phyllite pebbles).

Five samples from three of the eight cores were dated pre-LGM, providing new information on environmental conditions at that time. Below LGM lodgement till, composed by massive silty diamicton covering most of the plateau, different lithofacies have been distinguished. These latter form a thick succession of glacialfluvial and glaciallacustrine sediments above the bedrock, ranging in age from 42 to 38 ka cal BP. The finding of such lithofacies and related dating have revealed that, during pre-LGM period, the Pralongià plateau was in glacier-marginal conditions with the development of a lacustrine environment and glacialfluvial deposition. Full glacial conditions should have occurred only later than at least 38 ka cal BP.

This study provides the ground basis for further insight on the pre-LGM environmental conditions at high elevations in the Eastern Dolomites.