EGU2020-3426
https://doi.org/10.5194/egusphere-egu2020-3426
EGU General Assembly 2020

The late Matuyama glaciation in the southern European Alps

Giovanni Monegato[1] and Giancarlo Scardia[2]
[1]Italian National Research Council, Institute of Geoscience and Earth Resources, Padova, Italy
(giovanni.monegato@igg.cnr.it)
[2]Universidade Estadual Paulista (UNESP), Instituto de Geociências e Ciências Exatas, Rio Claro, Brazil
(giancarlo.scardia@unesp.br)

The onset of Pleistocene glaciations in the European Alps represented a significant change in the palaeoenvironmental settings of this mountain range. The stratigraphy of the event was described in the subsoil of the Po Plain (Muttoni et al., 2003; Scardia et al., 2012) and is marked by a regional unconformity (namely "Red unconformity", Muttoni et al., 2003) at 870 ka, in the final part of the Matuyama chron. Elsewhere, in the Alpine end-moraine systems the record of early stages of glaciations is scarce and cryptic. Spots of glacigenic deposits with reverse magnetic polarity were recognized only in the Ivrea (Carraro et al., 1991) and Garda (Cremaschi, 1987; Scardia et al., 2015) end-moraine systems, while deposits related to (peri)glacial environment were recorded along the Lombardian foothills (Scardia et al., 2010). The updated record of the Garda system shows the geometry of a late Matuyama glacier overrunning the piedmont plain with comparable size in respect to the LGM (Monegato et al., 2017). This indicates a fully glaciated Adige-Sarca catchment, one of the largest of the Alps, suggesting that the Alpine Ice Sheet reached one of its waxing climax during a late Matuyama cold stage (MIS20 or MIS22).

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