Shamb travertine, southern Armenia: evidence of rapid climatic and morphogenic changes around 9500 cal. BP in the Lesser Caucasus

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General context

The travertine system studied is in the Vorotan valley near the Shamb locality, Syunik region, southern Armenia (Fig. 1). The formations are developed in a former glacial valley connected to the Vorotan river. This major river in Armenia rises in the Syunik mountains and is confluent with the Arax near the Iranian border. The area is concerned by lower Pleistocene diatomitic fluvi-lacustrine deposits with rich palaeoecological content (Fig. 3, Ollivier et al., 2010, Joannin et al., 2010).

Methodology and results

The geomorphological methodology used is a high-resolution morphosedimentary sequential analysis including palaeoecological data. The chronology is constrained by 14C dating (Fig. 4).

In terms of sedimentary facies, our results clearly show the progression of temperature and humid conditions since the Last Glacial Maximum with an optimum ranked around 9000-5500 cal. BP. These conditions are expressed through the progressive development of various travertine facies, from chalky units to sharp carbonated deposits that underlie the growth of hydroxylaminic conditions in the valley (Fig. 3). A major phase of accumulation is also highlighted at this time. The pollen analysis almost completed will define more precisely these results. The presence of this step-like fire levels in some subjacent Lateglacial travertine facies probably underline a short period of drier climate around 12000 cal. BP (Younger Dryas?).

The Shamb travertine can be characterized as a real composite stratigraphic sequence for the definition of the Rapid Postglacial Climate Changes in Lesser Caucasus.

Conclusions

Then, the steppe and dry conditions occurs before a new renewal of morphogenic tendencies orientated towards the thalweg line inclination. This study sets the first step to the knowledge of landscape mutations in connection with climate changes and human occupations since the end of the last climatic cycle in this region. It takes part of the Quaternary morphogenetic and palaeoenvironmental pattern already proposed for the 1.4 Ma to Holocene period in this region (Fig. 6).

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