



Glacial history of a mid-altitude mountain massif: cartography and dating in the Chablais area (France, Switzerland)

A. Perret (1,2), E. Reynard (2), and J.-J. Delannoy (1)

(1) EDYTEM Laboratory, University of Savoie, Campus Scientifique, F-73376 Le Bourget du Lac cedex, (2) Institute of Geography, University of Lausanne, Anthropole, CH-1015 Lausanne

The Chablais area, considered as one of the cradles of glaciology (de Charpentier, 1841; Morlot, 1859), has been studied for a long time but several questions still remain unresolved. This study aims to reconstruct the glacial history of the massif, in order to explain the glacial landforms, which constitute an important part of the local geomorphology. The study focuses on the last glacial cycle (OIS 5 – OIS 2).

The area is primarily associated with the Valais glacier, by several local glacial flows and, to a lesser extent, by the Giffre glacier. Its position at the interface of the important Valais glacial flow and less powerful local flows is a specificity of the study area, which implies several bifurcations, penetration of the main glacier into lateral valleys, damming situations, and different responses of the various ice bodies to climatic changes.

The study is divided in four steps. (1) The first step was to carry out a wide bibliographic survey to identify the state of knowledge, especially in relation to areas previously poorly studied and areas that needed to be reconsidered given developments in dating methods. (2) Field surveys allowed us to complete observations and prepare local geomorphological maps (of glacial landforms and associated phenomena). (3) The third step was to assemble heterogeneous data (old and new maps, Digital Terrain Models, aerial photographies) in a GIS to establish maps of glacial stages. (4) Finally, the absolute and relative chronology of deglaciation (Guitter, 2003) was completed by cosmogenic nuclide dating. Results have allowed us to address the conditions of glacial landform deposition and evolution in a mid-altitude mountain range, and show the need to be prudent in comparing results of different dating methods. Our results suggest that the ages obtained are overall too young in regard to ^{10}Be ages on the northern alpine foreland (Ivy-Ochs et al., 2004) and are in conflict with ^{14}C dates obtained in the area (Triganon et al., 2005).

References

de Charpentier, J. (1841). *Essai sur les glaciers et sur le terrain erratique du bassin du Rhône*. M. Ducloux, Lausanne.

Guitter, F. (2003). Contribution pollen-analytique à l'histoire de la végétation au cours des derniers 100'000 ans dans la région d'Evian (Haute Savoie, France). Implications pour la chronologie du dernier glacier du Rhône. Thèse, Université de Droit, d'Economie et des Sciences d'Aix-Marseille, Aix-Marseille.

Morlot, A. (1859). Sur le terrain quaternaire du bassin du Léman. *Bulletin de la société vaudoise des sciences naturelles*, 6, 101-108.

Triganon, A., G. Nicoud, F. Guitter, et B. Blavoux (2005). Contrôle de la construction de l'ensemble détritique de la région d'Evian par trois phases glaciaires durant le Würm. *Quaternaire*, 16(1), 57-63.

Ivy-Ochs, S., J. Schäffer, P. W. Kubik, H.-A. Synal, et C. Schlüchter (2004). Timing of deglaciation on the northern Alpine foreland (Switzerland). *Eclogae Geologicae Helvetiae*, 97, 47-55.