



Relative surface age-dating of alpine rock glaciers: An Example from the Hohe Tauern Range, Central Austria

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Age dates on rock glaciers represent a potentially important source of palaeoclimatic information. In particular complex rock glaciers might have evolved over a period of several thousand years and deciphering their genetic history is a difficult or expensive task. Since rather recent, the Schmidt-hammer method has been applied as a relative dating tool for rock glacier surface ages. Such a hammer is a light and portable instrument traditionally used for concrete stability testing by recording a rebound or *R*-value of a spring-loaded bolt impacting a surface. In this study, a Schmidt-hammer was used at three north-to-west exposed rock glaciers located in the glacially shaped, E-W trending Dösen Valley, Hohe Tauern Range, Austria. On each of the four rock glacier one to seven locations (with 50 individual *R*-value measurements at each site) close to the central flow line between the frontal ridge and the rooting zone were measured. For time constraining and calibration purposes complementary measurements were carried out on an active talus in the rooting zone and at outside sites located adjacent or down-valley from the rock glacier terminus. Results suggest a complex deglaciation history during the Late Glacial and Preboreal periods and reveal a long formation period for the rock glaciers starting already in the Preboreal chronozone. The largest of the three studied rock glaciers seems to have been active during most of the Holocene suggesting a rock glacier favourable climate on W-exposed slopes and at elevations above 2400-2500 m a.s.l. for most of the Holocene in the study area. More dating by this method are currently carried out at other large rock glaciers in the Hohe Tauern Range aiming to verify the results presented here as well as testing the robustness of this method as a relative surface age-dating tool on rock glacier surfaces.