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Preservation of Wuermian moraines in Corsica, western Mediterranean

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For the reconstruction of past mountain glaciers the preservation of the corresponding moraine ridges plays an important role. The better the preservation the better the possibility to date the advance and to correlate them in different valleys. Factors influencing the preservation are the composition of the moraine material, the position of the moraine in relation to ice and valley topography, the size of the valley and the climate since deglaciation.

On Corsica, situated in the western Mediterranean, mountain glaciation was widespread during the Wuermian. Moraines are preserved at many different places but also in very different quality. The mountain chain consists of granites in the central and southern part, whereas in the northern part rhyolites are dominating. Moraines on granitic bedrock are normally better developed and also better preserved than on rhyolitic bedrock, maybe due to lack of fine material in the rhylolitic material. Grusification of the granites provides material with grains down to sand size. Pelitic material lacks completely in both lithologies. Best preservation of lateral or latero-frontal moraines is observed in broad valleys. In some cases the good preservation allows the reconstruction of several advances as the large moraines ridges are staged moraines. In narrow U-shaped valleys, moraines are often eroded completely or only relicts can be found. On top of the well-preserved moraine ridges lie blocks with diameters ranging between 1 and 4 m. Granitic boulders are well-rounded in contrast to rhyolitic boulders which have sharp edges. The sphericity of the granitic boulders should be considered with care because the granite tends to spheroidal weathering. Accumulations of aligned boulders on top of a flat bank are the relicts of rinsed out moraines, a result of a glacial outburst flood or younger cold phases.

Total erosion of fine material is estimated to be about 0.5 m in 20 ka. Recent superficial erosion on the moraines seems to be very small because of the vegetation cover. Beneath the vegetation, chemical weathering due to dissolution by rain and organic acids prevails the erosion mechanism. Large scale erosion occurs mainly along gullies and rivers during summer thunderstorms with very heavy rainfall. Therefore the largest amount of erosion of fine material seems to have occurred during periglacial conditions after the glacier retreat.