RELATIONSHIPS BETWEEN ROCK GLACIERS AND GLACIERS DURING THE HOLOCENE IN THE ITALIAN ALPS.

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Rock glacier is a geomorphological term to define a debris body characterised by a surficial blocky cover, displaying fluidal structures. Most Authors consider rock glaciers as the main indicator of permafrost occurrence in high mountain areas although other authors consider the rock glacier an evolution of the glacial system during its shrinkage. Considering the surface geomorphology, a large part of the Italian rock glaciers show some relationships with glacial features (i.e. frontal or lateral morainic ridges just outside the main body of the rock glacier) and in general rock glaciers are developed where glacial Holocene evidences are lacking or very reduced. Moreover, the question of the origin of the ice within rock glaciers is also debated. Some authors considered the ice that crops out in the Gruben rock glacier (Whalley 1974) or that found in the tunnel cut through the Hurricane Basin rock glacier (Brown, 1925), to be glacier ice, while in both cases the same ice was interpreted by other authors (Haeberli et al., 1988, Barsch, 1987) as ground ice formed under permafrost conditions polygenetic in origin. The main aim of the paper is to show that rock glaciers can represent the final product of complex and discontinuous processes both of glacial and periglacial environment that reflect the climatic changes mainly during the Holocene. Rock glaciers are in fact, generally made up of different kinds of deposits, related to different depositional events including also discontinuous phenomena, such as rapid mass movements (e.g. rock avalanches) and glacial events. Moreover, rock glaciers can preserve in their internal structure different types of ice such as relict glaciers ice and ground ice that can record potentially the entire Holocene paleoclimatic history.