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Temporal evolution of weathered cataclastic material in gravitational faults of the La Clapiere deep seated landslide by mechanical approach

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After a few years of research, the observation and the analysis of the Deep Seated Landslides (DSL) suggest that these are mainly controlled by tectonic structures, which play a dominant role in the deformation of massif slopes. The La Clapière deep seated landslide (Argentera Mercantour massif) is embedded in a DSGSD (Deep seated gravitational slope deformation) affecting the entire slope, and characterized by specific landforms (trenches, scarps…). Ousite, the tangential displacement direction of the trenches and the scarps are controlled by the tectonic structures. The reactivation of the inherited fault in gravitational faults create a gouge material exposed to an additional mechanical and chemical weathering as well as an increased of leaching. The displacement of these reactivated faults gets increasingly important around the area of the La Clapière landslide and this since 3.6 ka BP. In this study, mechanical analysis, grain size distributions were performed and these data were analyzed according to their proximity the La Clapiere landslide and times of initiation of the landslide by 10Be dating. Triaxial test results show that the effective cohesion decreases and the effective angle of internal friction increases from the unweathered area to the weathered area. The whole distribution of the grain size indicates that the further the shear zone is open or developed, the further the residual material looses its finest particles. This paper suggests that the mechanical evolution along the reactivated fault is influenced by the leaching processes. For the first time, we can extract from these data temporal behaviour of the two main mechanical parameters (cohesion and angle of internal friction) from the beginning of the La Clapiere landslide initiation to now.