Aspromonte Geopark Project: a natural laboratory to show the slow movement of the Earth system

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The Aspromonte Geopark project rises from the peculiar geological history of this sector of the southern Italian peninsula, apparently in continuity with the rest of the thin-skinned thrust-sheet system of the Apennine-Magrebian orogenic system, although characterized by deep-seated crystalline basement rocks, interpreted as fragmented relics of a sector of the original southern European Variscan chain (Cirrincione et al., 2015). These rocks are the result of an ancient geological history rooted since the Paleozoic to arrive up to the already active seismogenic tectonic activity, passing through the Oligocene-Miocene syn-orogenic clastic deposition of the Stilo Capo d’Orlando Formation and the evaporitic deposits, which testifies the Messinian salinity crisis. This peculiar geological heritage allows the preservation of an articulated geodiversity that contribute to the unraveling of two orogenesis (i.e. Variscan and Alpine), testified by the presence of intensively deformed metamorphic rocks, involved in two orogenic cycles (Ortolano et al., 2005; 2014; 2020), as well as in the occurrence of syn-orogenic sedimentary deposits covered in turn by the back thrusting of the Varicolori Clays and the final deposition of the Gessoso-solfifera succession. At the moment, the growing Aspromonte Geopark counts 89 geosites, eight of which are of international importance and five inserted within territorial and cultural landscape units. Many of these geosites are able to experiment new ways to communicate, with the aid of new technologies (i.e. GIS, 3D Virtual outcrop reconstruction and VR), the slow movement of the Earth crust, testified and preserved in different geosites, where is possible to observe clearly the presence of mylonitic rocks (i.e. rocks involved in high strain-rate regime undergoing plastic deformation) as well as the occurrence of several types of folding system activation, such as flow perturbation fold system evolving to sheath folds (Fazio et al., 2017; 2018; Ortolano et al., 2020). This geological peculiarity can communicate as a metamorphic outcrop can be read as an Earth-moving view where are enclosed pieces of the memory of the rock incessant slow movement of Earth interior.

References