Recognizing salt-tectonics and the need for re-assessing strike-slip displacements in the Northern Calcareous Alps: Implications for lateral orogenic extrusion

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DOI: http://dx.doi.org/10.17169/refubium-41027

Salt tectonics has only been recently recognized as a significant element in the evolution of the Northern Calcareous Alps (NCA), along their entire length. Specific to the central NCA, a number of sedimentary growth wedges (implying Triassic salt-related syn-sedimentary deformation) and other evidence for Triassic salt tectonics have been recognized along two of the main Neogene strike-slip corridors of the central NCA: along the KLT (Königssee-Lammertal-Traunsee) fault and along the Ennstal segment of the SEMP (Salzach–Ennstal–Mariazell–Puchberg) fault. Similar features indicating Triassic salt tectonics have been documented along the Wolfgangsee corridor. Salt structures are typically characterized by the absence or condensation of stratigraphy above them. This explains why the Neogene strike-slip features are so consistently associated to the outcrop of “deep” (old) units of the NCA stratigraphy.

Recycling and tectonic of overprinting of zones of weakness is a usual feature, and it is therefore unsurprising that strike-slip of the NCA thrust sheets during Neogene lateral extrusion concentrated on previously existing salt structures. More surprising is the fact that, if Neogene strike-slip faults follow the trace of previous salt structures, this implies that the genesis of the rhomboidal map pattern of Neogene strike-slip corridors is actually inherited from a Triassic salt tectonics framework. This in turn implies that far from being a Neogene feature, the offsets of geological elements observed along the strike-slip corridors is, at least partially, Triassic in origin. An immediate conclusion is that estimates provided to date on the magnitudes of displacement for the central NCA Neogene strike-slip system require a revision. Likewise, the nature of the SEMP and its splays as purely Neogene structures (at least in their shallowest portion across the NCA stratigraphy) is questionable.

This contribution does not raise questions about the documented kinematics of the Neogene strike-slip system, which is solidly researched, but merely seeks to provide new insights that can help re-assess the actual role of strike-slip along the key strike-slip elements of the central NCA.