

The Dinaric Faults System: large-scale structure and rates of slip of the transpressive northeastern boundary of the Adria microplate

Adrien Moulin (1), Lucilla Benedetti (1), Magali Rizza (1), Petra Jamsek-Rupnik (2), Andrej Gosar (3), Didier Bourlès (1), and Jean-François Ritz (4)

(1) Aix-Marseille Université, CEREGE CNRS-IRD UMR 34, 13545 Aix en Provence, France., (2) Geological Survey of Slovenia, Dimičeva 14, 1000 Ljubljana, Slovenia., (3) Slovenian Environment Agency, Seismology and Geology Office, Dunajska 47, SI-1000 Ljubljana, Slovenia, and University of Ljubljana, Faculty of Natural Sciences and Engineering, Ljubljana, Slovenia., (4) Laboratoire Geosciences - UMR CNRS 5243, Université Montpellier 2, 34095 Montpellier Cedex 05, France.

Located at the northeastern corner of the Adria microplate, the Alps-Dinarides junction represents a key region for understanding how the microplate interacts with stable Europe. While the active tectonics of the alpine part of this area is relatively well-constrained, little is known about the present-day deformation imposed by the Adria rotation across the Dinarides.

Through morpho-tectonic analysis based on satellite and aerial images, accurate topographical maps and digital elevation models (including LiDAR) combined with field investigations, we have mapped in details the active faults of the Northern Dinarides, composed of three sub-parallel right-lateral strike-slip faults of N315 general trend (Idrija, Predjama and Rasa Faults). Based on this mapping and on geological data, we have identified forty cumulative tectonic displacements ranging from few meters to several kilometres, that allow deciphering how deformations have affected this area over the Pliocene to the present-day situation.

The Late Pleistocene period was mainly investigated using ^{36}Cl -exposure dating of displaced geomorphic markers combined with the existing chronologies of the glacial-interglacial landscape evolution in the area (e.g Monegato et al., 2007 ; Fontana et al., 2008).

The presented results yield 3.8 ± 0.7 mm/yr of active right-lateral faulting along the Northern Dinarides, equally shared between the three faults. The Adria rotation models (e.g Calais et al., 2002 ; D'Agostino et al., 2008; Weber et al., 2010) and the present knowledge of the lithospheric structure of the area (Brückl et al., 2010 ; Sumanovac et al., 2009) along with our results corroborates that the Northern Dinarides probably represents the main eastern boundary of the Adria microplate.

Extrapolating the obtained slip-rates over longer time-spans then allowed assessing the ages of kilometric (geomorphic and geological) displacements. It suggests that slip inception along the Idrija Fault occurred in the Early Pliocene, while the Predjama and Rasa Faults were later activated, probably about 1Ma ago.

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