PLEISTO-HOLOCENIC TRANSVESTIGE FAULTING IN THE CLOSURE SEGMENT OF THE WESTERN TELESINA VALLEY (CAMPANIAN APENNINES)

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The Telezina Valley is a large plio-quaternary W-E oriented semigemma made up of a bright internal arapatric plain, crossed by the river Calore Itrino, that separates the Matera Massif in the N from Campassoma in the S. This paper analyzes the western sector of the Valley, between the villages of Telezina, Solfacina and Castelvenere; in particular way a left transient due to transversal antiolic faults oriented along the Foskone are reactivated in many successivi tectonic phases have been studied.

Geodynamics in the Telezina Valley have been reconstructed. Cover-sinkholes and fault-springs show a hyperkarstic habit. Supposing active subphosphon, we completed the structural scheme along the left shear zone, modeling interactions between neotectonics, fluvial karst and hydrochemistry. A previous study (Soreca & Rinaldo, 2010) correlates hydrochemistry and neotectonics, so confirming hyperkarst for juveniles upwelling along The “Calore Fault” and the left transient faults of the shear zone.

THE STUDIED AREA SHOWS A VERY COMPLEX RECENT TECTONIC ACTIVITY THAT CAN BE RELATED TO 4 SUCCESSIVE STEPS THAT, SINCE THE END OF THE MIocene AND THE ACTUAL GENERATION OF A FAMILIES OF DIP-SLIP AND OBLIQUE FAULTS DUE TO PROGRESSIVE GENERATIONAL PHASES, WHILE THE CHAIN RANDED ANTICLOCKWISE NEW FAULTS GOT ORIENTED NW-SE AND NE-SW PRODUCING DIP-SLIP KINEMATICS, WHILE THE PREVIOUS STEPS FOLLOWED THE TECTONIC TRENDS INVOLVES FAULTS OF VARIOUS GENERATION, THUS IT IS NOT POSSIBLE ACTUALLY, TO EXCLUDE A PRIORI A POTENTIAL REACTIVATION OF ANY LOCAL TECTONIC AXIS, EVEN IF MAJOR SEISMICITY IS DUE TO NNNW-SE EXTENSIONAL FAULTS. OF NEW GENERATION. HISTORICAL EARTHQUAKES, ACTUAL SEISMICITY, STRATAGRAFIC TIMES OF PLEISTOCENE HYPERKARST IMAGERY PLATES AND ALLUVIAL TERRACES AND HYPERKARSTIC SUBPHOSPHON FROM HYDROTHERMAL SPRINGS AND FIELDS OF COVER SINKHOLES ARE CLUES THAT INTERRELATE EACH OTHER, ALLOW TO CONCLUDE THAT THE LOCAL FAULTS SUBSTANTIALLY CONTRIBUTE TO THE STRUCUTRAL MODELLING TODAY STILL IN PROGRESS, THROUGH EXTENSIONAL AND TRANSVERSAL ACCOMODATION ACCORDING TO THE KINEMATICS SUGGESTED IN THE PRESENT MODEL.

References

FROM THE ELABORATION OF THE DATA TO THE BUILDING OF A SCIENTIFIC MODEL: NEOTECTONICS OF TELESINA VALLEY

There are 4 orders of high dipping faults and a hypothetical buried thrust. The NE front of Monteputagano is tectonically overthrusting the Red Flysch; according to the model the structure is part of a unique internal thrust of serravallian age that spans to the NNE front of the Monti Casaroauro and Pentemi; subsequently dashed by postinoclastic transfer faults. The high dipping faults show dip-slip, strike-slip and intermediate kinematics. The 4 preferential orientations show uniform with low standard deviation, thus we believe that the accommodate of the structural network to the plio-paleocenese anticorsswise rotation of this area may have occurred stepwise (4 successive well distinguishable phases) and not in a gradual way, lacking at all intermediate orientations that could suggest partial rebalancing of the stress field. The tectonic processes, the orientation of stress tensor, the age of deformations and the hipnotized average focal mechanisms (stress drops) are shown below. The analysis of the network individuates 4 different generation families, whose age of genesis is surely progressive, although we can not say anything about their actual state of activity. The only sure clues are the recent seismic sequences provided by INGV (site luso): we computed 4 since 2005 until the 2011 in the studied area and they may belong both to transensive than extensive faults and they would testify that actual seismic activity has intermediate magnitude involving not only fault systems of last generation. As previously verified (Soreca & Rinaldo, 2010) recent juvenile activity involved the 6 springs located along the transverse intersections of the hypostatized “Calore Fault” and induced hyperkarst in the fields of cover sinkholes. Those ones, localized along the main recent tectonic alignments as visible in the map, are more active at higher altitudes than 15-20 m above the actual riverplain of Telezina (7-80 m a.s.l.), because the reachment of slope definitively dislocated the bottom of the dolines and valve the vadose karstic network, responsabile of subphosphon. Actually new cover sinkholes are in formation along the alignments that criss cross the travertine plate and the pleisto-holocenic deposits on which the town of Telezina has been built.

The area is located in the W of the Telezina semigemma. There are transversal faults and a ÉNE-oriented thrust maybe evolved in Jaff in the E of Montepugetano. Carbones lie on NNE-oriented langhanth thrust (Camposano thrust) over Red Flysch and discordant Cisalpine Calcarei. Montepugetano (internal southern part) and Calore Itrino (external southern part) is separated from those byes for a shear zone. In the Tortonian the complessive formation migrates in Ne: an extensional NE-SW trend accommodate contrapole normal faults of first generation striking NW-NE and SSE-NNE. The pliconic antitensorial rotor generates a second network and induces right transition on antipericline axis and left on antaisometric ones rearranged according to the new stress field. The left NW-SE superposed transversal faults, are transfer faults between the two thurads. Paleontological reactivation is visible in breccias of first and second generation (same age at Calda Pizzizzero and Montepugano), spas and fault planes. The two oldest alluvial tectonic systems of Calore River are hit with similar dip on the right and left bankaua, like a parallelism of Torre Soreca. The hyperkarstified springwater shows thenncl and hydrochemical anomaly along the transversal Flu-Bibo-Grasso fault and intersections, increase of 3.5°D with high values of E residue, hardness and pH are typical for Flu-Bibo, Flu-Bibo-Grasso, Flu Sant-Marco, Terme di Telezina and Foskone. Flu Bibo, Flu S. Arturino and Terme of Telezina, connected to the deep “Calore Fault”, show alkaliterrous-turbid-alkaline water with HS- CO3 and dissolved O2 at hypohypsic levels; the other ones, at the junction with left transient faults, are bicarbonate-alkaline, low in H2S and dissolved in O2.