

**Report on the  
INQUA 6<sup>th</sup> INTERNATIONAL WORKSHOP  
“ACTIVE TECTONICS, PALEOSEISMOLOGY AND ARCHAEOSEISMOLOGY”  
Fucino 2015. April 19-24, 2015, Pescina (AQ)**

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**ABSTRACT:** The INQUA 6<sup>th</sup> International Workshop on Active Tectonics, Paleoseismology and Archaeoseismology, held in Pescina (L'Aquila, Italy) on April 19-24, 2015, pointed out the recent scientific outcomes derived from both classical and new methodological approaches and techniques, and included a two-day field trip in the epicentral areas of the 1915 Fucino earthquake and of the April 6, 2009, L'Aquila earthquake.

**Keywords:** Paleoseismology, active tectonics, INQUA Workshop, Fucino 2015, Italy

One hundred years after the great Marsica earthquake (estimated magnitude 7), that hardly struck central Italy on the 13<sup>th</sup> of January, 1915, the International Union for Quaternary Science (INQUA) sponsored the 6th International Workshop on Active Tectonics, Paleoseismology and Archaeoseismology. The workshop was organised by Istituto Nazionale di Geofisica e Vulcanologia (INGV), Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA) and Università dell'Insubria, to foster discussion, and to share the most recent achievements, between different disciplines in the field of the earthquake geology.

Such an important scientific appointment was held between April 19 and 24, 2015, in the town of Pescina, which is located in the epicentral area of the 1915 earth-

quake. The town was the ideal stage to commemorate the tragic event, as the earthquake traces can still be distinguished on the remnants of the walls of the old town centre that, together with many villages and towns around the Fucino plain area, stand as open air memorials in honour of the more than 30000 fatalities.

The workshop gathered together more than two hundreds researchers from all continents, who daily spend their efforts in the earthquake science, with the aim of obtaining up-to-date information to be incorporated in seismic hazard analyses and to be used for mitigating seismic risk.

The participants attended to a three-day scientific discussion on Quaternary geology, paleoseismology, earthquake engineering, seismic hazard, tsunami haz-



Fig. 1 - Northern wall of the trench dug across the 1915 earthquake surface rupture. Main fault plane, red arrow



Fig. 2 - Wall of the "Cava Santilli" quarry showing the Fucino fault plane (yellow arrows) that places in contact Holocene slope deposits, in the hanging wall (on the left), with the carbonate bedrock, in the footwall (on the right).

ard and archaeoseismology, followed by a two-day field-trip in the epicentral areas of the 1915 earthquake and of the 6th of April, 2009 L'Aquila earthquake (moment magnitude 6.1). The most recent scientific outcomes derived from different methods and techniques – i.e., from the classical geological field investigations to the cosmogenic nuclides dating of exposed fault planes – were illustrated by a large number of oral and poster presentations.

The first day of field trip was spent along the Fucino plain area, specifically along the trace of the active normal fault that ruptured during the 1915 earthquake, known as the Fucino fault. Firstly, a paleoseismological trench dug ad hoc for the meeting purpose across the surface rupture reported by Oddone – the seismologist that surveyed the Fucino area in the aftermath of the event – was visited (Fig. 1). In general, paleoseismological trenching aims at unveiling the kinematic history of a given active tectonic structure, by defining how often it moves, the elapsed time since the last activation, and how strong can be an earthquake determined by the fault activation. At this purpose, one or more excavations are made across the surface expression of an active fault in order to uncover recent sediments that might have undergone deformation induced by the fault motions.

The trench visited during the workshop, and illustrated by Paolo Galli (DPCN), aimed at showing the participants the geological traces of the surface faulting occurred during the 1915 seismic event, and of previous episodes of fault activation. In particular, the analysis of the trench walls allowed the identification of the faulting event occurred during the Late Antiquity, in 508 (or 484) AD; this event resulted in a large magnitude earthquake – comparable to the 1915 one – that determined heavy damages to the ancient settlements surrounding the

Fucino area, being also likely responsible for significant damages to Colosseum in Rome.

Secondly, a quarry (known as Cava Santilli) located close to Venere dei Marsi was visited during the fieldtrip; it exposed one of the planes of the Fucino fault that brought the carbonate bedrock (footwall) into contact with late Holocene slope-derived deposits (hanging wall) (Fig. 2).

The scarplet related to the northernmost segment of the Fucino fault, affecting the south-western slopes of the Magnola Mts., was also shown and the evidence of both the long-term and recent activity of the structure, represented by the displacement of slope deposits spanning the whole Quaternary, was illustrated. Paolo Messina (CNR-IGAG) described the Quaternary stratigraphic sequence hosted by the Fucino basin, in particular the succession exposed near Pescara.

Finally, the remnants of the 1915 earthquake coseismic scarp were also visited and described by Alessandro M. Michetti (Università dell'Insubria); furthermore, Gerald Roberts (Birkbeck University of London, UK) described the Holocene exposition history of the Mt. Serrone fault scarp, related to one of the segments of the Fucino fault.

The second day of the field trip was devoted to the L'Aquila-San Demetrio ne' Vestini basin area, the epicentral zone of the 2009 earthquake. During the first part of the fieldtrip, the scarp related to the San Demetrio active normal fault was shown by Anna Maria Blumetti (ISPRA) and the results of paleoseismological analyses made along the fault were discussed. Then, the early Quaternary continental stratigraphic sequence hosted by the L'Aquila-San Demetrio ne' Vestini depression was depicted by Stefano Pucci (INGV), Fabio Villani (INGV) and colleagues (Fig. 3), particularly the paleo-deltaic succession exposed by a quarry in the area of Poggio



Fig. 3 - S. Pucci and his INGV colleagues illustrate the stratigraphic framework of the L'Aquila-San Demetrio ne' Vestini basin.

Picenze. Then, a normal fault active during the early stages of formation of the depression was shown along the Fosso dell'Inferno fluvial incision.

At the end of the field trip the city of L'Aquila was visited. Laura Graziani (INGV) and Filippo Bernardini (INGV) illustrated the seismic history and provided the macroseismic description of the city. Sara Amoroso (INGV), Francesco Potenza (Università dell'Aquila) and Giacomo Tironi (freelance engineer) showed the participants the damages induced by the 2009 seismic event and described the current restoration activities.

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