R. Caputo (1) and S. Pavlides (2)

(1) Di.S.G.G., University of Basilicata, Macchia Romana Campus, Potenza, Italy
(2) Department of Geology, Aristotle University of Thessaloniki, Thessaloniki, Greece

INSIGHTS FROM 10 YEARS OF PALAEOSEISMOLOGICAL INVESTIGATIONS IN THE AEGEAN REGION

The knowledge of the spatial and temporal complexity of earthquake recurrence is essential for reliable seismic hazard evaluation and the development of new concepts about the earthquake generation process. Palaeoseismological studies based on trenching investigation of fault colluvial tectono-stratigraphy can facilitate to chronologically extend the historical seismological information and thus can provide crucial data regarding the occurrence of destructive prehistoric earthquakes.

Several active faults affecting the broader Aegean Region have been investigated for a better understanding of their seismogenic behaviour. By analysing their geometry, kinematics and seismotectonic characteristics, several common features can be emphasised. Indeed, all structures are mainly dip-slip normal faults, 10-40 km long, commonly active since Middle-Late Pleistocene, characterised by moderate to strong earthquakes (M ≈ 6-7), maximum vertical displacements of some 10 s to few 100 s of centimetres and return periods of 100 s to 1000 s of years.

We consider almost ten years of palaeoseismological investigations carried out in the Aegean Region, mainly Greece and Southern Bulgaria, focusing on two aspects. Firstly, we analyse the surface effects of morphogenic earthquakes (Caputo, 1993), like the co-seismic displacement associated to past events and the length of the seismogenic structures. Secondly, based on few assumptions, new field observations and literature data, we also attempt to calculate the maximum seismic moments possibly associated to the past earthquakes documented from palaeoseismological trenches. These seismic moments are then compared with those estimated for historical earthquakes for which both maximum vertical displacement and surface rupture length are available (Pavlides and Caputo, 2004). Similarities and differences of the two datasets are discussed showing that palaeoseismological results are possibly systematically underestimated.

For selected faults, we could also obtain reliable values for the recurrence interval of moderate to large earthquakes and of the slip-rate. Differences in these parameters are attributed to the different geotectonic settings.

REFERENCES