



Evidences of the 1755 Lisbon earthquake in urban environment (Lisbon)

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In Western Iberia the seismicity is strong enough to produce high magnitude earthquakes. Although the geological faults responsible for those seismic events aren't as frequently active as other faults in Mediterranean countries like Italy, Greece or even Turkey, they are able to reach magnitudes such as the one experienced in 1755. This paper focuses, not only in analyzing that seismic manifestation in a sedimentary context, but also enhances the tsunami that followed that earthquake.

In the city of Lisbon (Belém neighbourhood), works related to urban renewal made possible the exposure of several outcrops for 2h30m. The available time allowed the team to make a photographic record, georeference the site, make a field analysis of the deposits exposed – a beach deposit – identify several beach layers (sandy or pebble), take samples and measure the paleocurrents of the imbricate rounded clasts.

The observations of archaeological and sedimentological profiles on the excavating site led to the acknowledgment of a former riverside morphology that precedes the current street alignment. In addition, an ancient cliff cut into the Lisbon Volcanic Complex, dated from the Paleogene, was discovered, which is fossilized by the mentioned sequence of beach deposits with several layers of pebbles and sandy heavy minerals, some of them showing disturbance features.

Those sediments also prove that different energies of transport were responsible for this sequence, like strong waves, for example.

The sedimentological analysis, the paleocurrents' directions and the modelled waves will be presented.

Moreover, the ¹⁴C dating proved that the two human skeletons that were found on the analogous stratigraphic layer are dated from the middle 18th century. Therefore, it is considered that a strong relation between a destructive episode and the death of those two individuals is not a coincidence.

The tsunamiite found on one of the medium-size sandy layers not only stresses the destructive tsunamic event, but also reinforces the importance of the detailed sediment analysis. This tsunamiite is one of the first records of its kind in the urban Portuguese territory. Further research will be developed.

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