



Tsunami hazard and vulnerability assessment along Salento coast (Apulia, southern Italy)

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Geomorphological research carried out along the coast of Salento (Apulia, southern Italy) points out the effects of several large tsunamis which struck this region during the last five hundreds years.

The collated field data integrate the scant information that have been extract by historical chronicles and reported into the available tsunami catalogues. The coastline of Apulia, in fact, has been deserted up to the beginning of the last century due to the diffuse presence of coastal swamps and of *malaria* disease. So, it can not be surprising that very few news about the occurrence of tsunami can be found in historical reports.

Geomorphological research focused mainly on the boulder accumulations that mark numerous tracts of Salento rocky coast. These accumulations are constituted by boulders which lay sparse on low-elevated rocky platforms or are arranged in embricated groups made of few elements or form impressive ridges compound by hundreds of rocky elements. Detailed geomorphological surveys have been performed to determine the main characteristic of accumulation, such as elevation, distance from the coastline, boulder weight and orientation, and so on. Embrication axis azimuth and elongated boulders orientation allow the estimation of tsunami propagation direction. Hydrodynamic calculations have been performed on largest boulders to prove that their carving, transport and deposition can not be produced by the weak storm waves recorded into the southern Adriatic and northern Ionian Sea.

Chronological elements useful for dating boulder accumulations have been obtained by AMS radiocarbon analyses performed on bioencrustation, occurring on the surface

of boulders quarried from below sea level, or from biogenic material entrapped inside the accumulation during the transport. Some of these radiocarbon determinations have been integrated by morphological and archaeological data.

The whole of collated data indicates that eastern Salento region is prone to tsunamis generated by earthquakes produced along the active tectonic structures running along the Dalmatian, Albanian and Greek coasts. In fact, field data mark the effects of 6th April 1667 earthquake that struck Ragusa (modern Dubrovnik) and those impressive ones of 20th February 1743 earthquake that hit the coastal regions facing the Otranto Strait.

The Ionian coast of Salento has been affected by a tsunami most likely produced by a submarine landslide which interested the steep submarine slope occurring few kilometres offshore the western Salento coastline. This landslide would have been triggered by the strong 5th December 1456 earthquake.

In summary, geomorphological research points out that tsunami hazard along the Salento coast is more elevated than supposed before on the basis of historical reports and that the assessment of tsunami risk in this region can not be neglected.

A step towards tsunami risk assessment along the coast of Salento region has been realized by the assessment of coastal vulnerability which has been defined in function of coastal morphology and taking into account the available post-event reports as well as the geological literature on paleo-tsunamis.

Finally, the data set has been entirely reversed into a Geographical Information System which will be used to define the Tsunami Risk along the Salento coast and for the modelling of some possible future scenarios.