



## Geoarchaeological documentation of a series of destructive events at Montegibbio Roman villa site

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The Italian territory is rich in archaeological heritage, located in hilly, plain or coastal areas. Frequently, it is possible to find only the remains of ancient cultures, villages and sparse houses dating back many centuries. Therefore, no other documentation but the remains themselves can give information about both the existence and the events that eventually determined the end of historical sites, caused either by abandonment or destruction. The causes that can determine the abandonment or the destruction can be various, and may be due to anthropic and/or natural causes, and only in very few cases documents or pictures of these events are preserved. Anthropic causes can be diverse: wrong design and/or building schemes of the structure or of the foundation, wars etc. Natural causes could be various as well, and can be related to the environmental context of the site. For example, in mountainous areas the main causes can be landslides, snow avalanches, soil creep affecting the foundations. In plain areas floods are the main process leading to the disruption of hamlets. Along the coast tsunamis are to be considered. Other natural causes could be earthquakes or climate changes.

In the Emilian Apennines, near Sassuolo (Modena, Italy), a Roman villa dated from the I century B.C. to the VI century A.D. has been excavated along a gentle slope. The villa can be divided in four different buildings from successive periods. During the first period of life of the villa (I century B.C.-I century A.D.) a destructive event caused the abandonment of this building, whose walls and mosaic floors have been destroyed in an odd way. Which was the cause of this destruction? An earthquake, a human error in construction or a landslide? What makes this question even more interesting is the probable relation of this event with an ancient source (Pliny the Older, *Naturalis Historia* II, 199) who remembers how in the Modena area a “portentum terrarum” (earthquake) and the collision of two mountains destroyed buildings and properties. Historically, the Sassuolo hills are identified as the location of this event, where similar destructive events have been attested also later on, also in correlation with the presence of mud volcanoes nearby the area.

The research is aimed at defining the causes that determined the destruction of the Roman villa located along the Montegibbio slope. The study was carried out with a multidisciplinary approach, integrating several experts, including archaeologists, geologists and engineers. At present, no document or picture referring the causes of the destruction have been found. Therefore, in order to draw some hypotheses on the nature of the events, the analysis of the deformation of the remains, of the foundation of the buildings and the reconstruction of the slope evolution have been carried out. The results obtained so far highlight the fact that integration of geological records and archaeological evidence is the key point to unravel the evolution of this historical site.