Scientists confirm Justinianic Plague caused by bacterium Yersinia pestis

May 10 2013

Credit: Thomas Hartmann

(Medical Xpress)—From the several pandemics generally called 'pestilences' three are historically recognized as due to plague, but only for the third pandemic of the 19th-21st centuries AD there were microbiological evidences that the causing agent was the bacterium Yersinia pestis.

"For a long time scholars from different disciplines have intensively

discussed about the actual etiological agents of the past pandemics. Only ancient DNA analyses carried out on skeletal remains of plague victims could finally conclude the debate", said Dr. Barbara Bramanti of the Palaeogenetics Group at the Institute of Anthropology at Johannes Gutenberg University Mainz (JGU).

About two years ago, she headed the international team which demonstrated beyond any doubt that Y. pestis also caused the second pandemic of the 14th-17th centuries including the Black Death, the infamous epidemic that ravaged Europe from 1346-1351. Bramanti and her Mainz colleague Stephanie Hänsch now cooperated with the University of Munich, the German Bundeswehr, and international scholars to solve the debate as to whether Y. pestis caused the so-called Justinianic Plague of the 6th-8th centuries AD.

The results of ancient DNA analyses carried out on the early medieval cemetery of Aschheim in Bavaria were published last week in *PloS Pathogens*.

They confirmed unambiguously that Y. pestis was indeed the causing agent of the first pandemic, in contrast to what has been postulated by other scientists recently. This revolutionary result is supported by the analysis of the genotype of the ancient strain which provide information about the phylogeny and the place of origin of this plague. As for the second and third pandemic, the original sources of the plague bacillus were in Asia.

"It remains questionable whether at the time of the Byzantine Emperor Justinian only one strain or more were disseminated in Europe, as it was at the time of the Black Death," suggested Bramanti and Hänsch. To further investigate this and other open questions about the modalities and route of transmission of the medieval plagues, Bramanti has recently obtained an ERC Advanced Grant for the project "The medieval

plagues: ecology, transmission modalities and routes of the infection" (MedPlag) and will move to the Center for Ecological and Evolutionary Synthesis (CEES) at the University of Oslo in Norway. The CEES, chaired by Nils Chr. Stenseth, has an outstanding and rewarded record of excellence in the research on infectious diseases and in particular on Y. pestis.

More information: Harbeck, M. et al. (2013), Yersinia pestis DNA from Skeletal Remains from the 6th Century AD Reveals Insights into Justinianic Plague, *PLoS Pathog* 9(5): e1003349. doi:10.1371/journal.ppat.1003349

Provided by Universitaet Mainz