Max Planck Institute for Evolutionary Anthropology
Max-Planck-Institut für evolutionäre Anthropologie

PRESS RELEASE
17 November 2015

***** EMBARGOED UNTIL:**
Tuesday, 17 November 2015, 11:00 o'clock CET ***

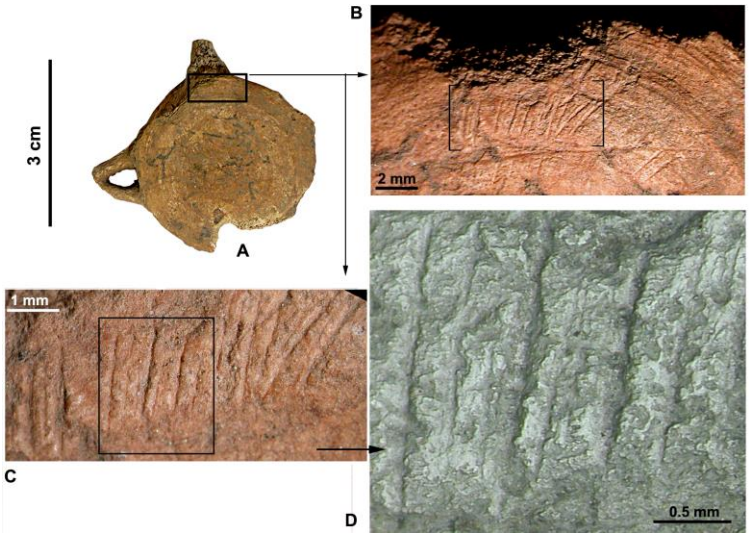
Cetacean strandings increase dramatically at times of rapid climate change

Researchers of the Department of Human Evolution at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, in collaboration with colleagues from different Italian institutions, have uncovered evidence that strandings of different cetacean species increased in the Mediterranean as a result of environmental changes linked to the rapid climate change that took place around 8,200 years ago. The findings imply that abrupt climate change, of similar entity as worst-case scenarios for global warming, dramatically affects strandings and may represent a serious threat for cetaceans in the next few decades.

An international research team undertook detailed zooarchaeological, isotopic and rardiocarbon analyses on the rich bone assemblage from the site of Grotta dell'Uzzo in Sicily, which is stored at the Museo Archeologico Regionale 'Antonino Salinas' (Palermo) and the Museo Nazionale Preistorico ed Etnografico 'Luigi Pigorini' (Rome). Ivana Fiore and Antonio Tagliacozzo, of the latter institution, found that numerous cetacean bones from Grotta dell'Uzzo bore cut marks, compatible with the butchery of dolphins and whales to attain transportable edible portions of carcasses of stranded cetaceans.

The timing of the strandings was established by AMS radiocarbon dating conducted by Sahra Talamo of the Max Planck Institute for Evolutionary Anthropology on the bone collagen of cetaceans and other organic remains from Grotta dell'Uzzo. Isotope analyses of diet were

important to corroborate the original archaeological hypothesis on the exceptionality of these stranding episodes. In fact, only the hunter-gatherer who lived during the so-called Mesolithic-Neolithic transition, and who was contemporary to the strandings, was found to have attained around one third of his or her dietary protein from cetacean meat. Cetaceans should have been available every year for an adult human to acquire such high proportions of protein from their consumption.



Project coordinator Marcello Antonio Mannino (Max Planck Institute for Evolutionary Anthropology and School of Culture and Society at Aarhus University) summarizes the main discovery as follows: “Predicting the effects of global warming for highly mobile marine mammals is difficult. It has been hypothesized, however, that a major threat for cetaceans is represented by climate-driven environmental changes affecting the abundance and distribution of their prey”. He adds: “Our archaeological case study establishes a link between the so-called 8.2-kyr-BP event, a rapid deterioration in climate, and annual mass strandings of different odontocete species in the Mediterranean Sea at the time. Our investigations clearly show that the archaeological record and its interdisciplinary study provide us with unique insights into the consequences of climate change on past ecosystems and on how our ancestors opportunistically adapted to them”.

Mass strandings of live cetaceans have puzzled naturalists since the days of Aristotle and their causes are often unclear even when they occur today. These dramatic natural phenomena never fail to attract public attention and, whenever cetaceans mass strand, the media pose the question of whether humans are to blame for them. This research suggests that, if human-induced climate change continues at its current pace, strandings may intensify in the next few decades with potentially catastrophic consequences for cetaceans, as predicted by cetologists.

“Another important contribution of this research has been to generate what is to date one of the largest isotopic datasets for early Holocene humans and associated fauna”, comments senior author Michael P. Richards. “This has allowed us to show that surprisingly, and contrary to Mesolithic hunter-gatherers living on the Atlantic coasts of Europe, those who occupied Grotta dell’Uzzo (with the exception of the individual from the Mesolithic-Neolithic transition) relied little on marine resources” adds Richards.

[MAM]

Original publication:

Marcello A. Mannino, Sahra Talamo, Antonio Tagliacozzo, Ivana Fiore, Olaf Nehlich, Marcello Piperno, Sebastiano Tusa, Carmine Collina, Rosaria Di Salvo, Vittoria Schimmenti & Michael P. Richards

Climate-driven environmental changes around 8,200 years ago favoured increases in cetacean strandings and Mediterranean hunter-gatherers exploited them

Scientific Reports, 17 November 2015, DOI: 10.1038/srep16288

Images:

Page 1: View of Grotta dell'Uzzo from the north. (Copyright: Marcello A. Mannino)

Page 2: Cut marks produced on a cetacean vertebra to detach a portion from the carcass of an oceanic dolphin (Delphinidae) for human consumption. Photo A shows the actual bone, photos B and C are magnifications of the cut marks and photo D is a Scanning Electron Microscope image showing that as well as roughly parallel striations, some oblique marks were produced on the bone. (Copyright: Ivana Fiore)

Contacts:

Dr. Marcello A. Mannino
Max Planck Institute for Evolutionary Anthropology, Leipzig &
School of Culture and Society, Aarhus University
Tel: +49 15757584022 ; +45 91868105
Email: marcello_mannino@eva.mpg.de ; marcello.mannino@cas.au.dk

Dr. Sahra Talamo
Max Planck Institute for Evolutionary Anthropology, Leipzig
Tel: +49 341 3550-355
Email: sahra.talamo@eva.mpg.de

Dr. Ivana Fiore & Dr. Antonio Tagliacozzo
Museo Nazionale Preistorico ed Etnografico 'Luigi Pigorini', Roma, Italy
Email: iva_fiore@yahoo.it & tagliant@tin.it

Professor Michael P. Richards
University of British Columbia, Vancouver, Canada
Email: michael.richards@ubc.ca

Sandra Jacob
Max Planck Institute for Evolutionary Anthropology, Leipzig
Press and Public Relations
Tel: +49 341 3550-0
Email: info@eva.mpg.de