

Llama dung contributed to Inca success in the Andes

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Image: Johann Dréo/Wikipedia

(PhysOrg.com) -- The famous Inca city of Machu Picchu in the Peruvian Andes was rediscovered by American explorer Hiram Bingham in July 1911 and the area plans to hold a special 100 year celebration this year. However, the famous city and the Inca civilization have already hit the spotlight in a new study published in *Antiquity* that links the use of llama dung to the Inca success in high altitude agriculture.

Alex Chepstow-Lusty from the French Institute of Andean Studies in Lima has spent the last few years analyzing mud samples from a small lake located between the jungle and Machu Picchu. By analyzing a 6.3 meter long core sample taken from the lake bottom, Chepstow-Lusty and his team discovered a correlation between a spike in the number of mites and maize pollen 2700 years ago. These mites feed on animal excrement

and the researchers believe that the use of llama dung as a fertilizer was what enabled the Incas to grow corn in their high altitude location.

Llamas were used as a source of meat and wool, as well as used to carry items. Llamas defecate communally, so it was an easily collectable source of natural fertilizer. This use of natural fertilizer aided in the maize crops thriving and allowed the Incas to move away from their dependence on wild quinoa and increase their caloric intake with maize.

Other researchers, such as Christine Hastorf from the University of California, Berkeley argue that the argument for fertilization has not yet been proven. While this new research does show an increase in mites and llama dung, there is no evidence to show it was used as a [fertilizer](#). She points out that plants that are fertilized with animal manure have a higher nitrogen isotopic signature. In order to show a connection between the two, she believes there needs to be studies done on ancient plant remains and the bones from the ancient Inca people in the area.

More information: Agro-pastoralism and social change in the Cuzco heartland of Peru: a brief history using environmental proxies, by Alex Chepstow-Lusty, Volume: 85 Number: 328 Page: 570–582. antiquity.ac.uk/ant/085/ant0850570.htm

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