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PROGRESS REPORT FOR AINGRA09033P

PROJECT TITLE	Identifying human impacts on the Holocene environment of Western Flores, Indonesia	
INVESTIGATOR(S)	Institution and Department	
Chief Investigator	A/Professor Jian-xin Zhao	CMM, The University of Queensland
Other Investigators	Dr Ken Aplin, CSIRO, Ken.Aplin@csiro.au Dr Quan Hua, ANSTO, qhx@ansto.gov.au	
Students	Ms Emma St Pierre, e.stpierre@uq.edu.au	
ANSTO Investigators	Quan Hua	
Specialist Committee	A	

SCIENTIFIC OBJECTIVES

This proposal aims to obtain C-14 dates for charcoals collected from an excavation of fossil-bearing sediment profiles at the entrance of Liang Luar cave (1-km away from Liang Bua the type site for *Homo floresiensis*), western Flores, Indonesia. The results will be compared with other independent U/Th-dated records from the cave, to elucidate the timing of anthropogenic impact on the faunal sequence such as the arrival of commensal rodent species *Rattus rattus*, as well as land-use practice and soil erosion above the cave. In combination with speleothems-based palaeoclimate and palaeoenvironmental reconstruction this study aims to examine human impacts on the Holocene environment in western Flores.

PROGRESS REPORT and RESEARCH OUTCOMES

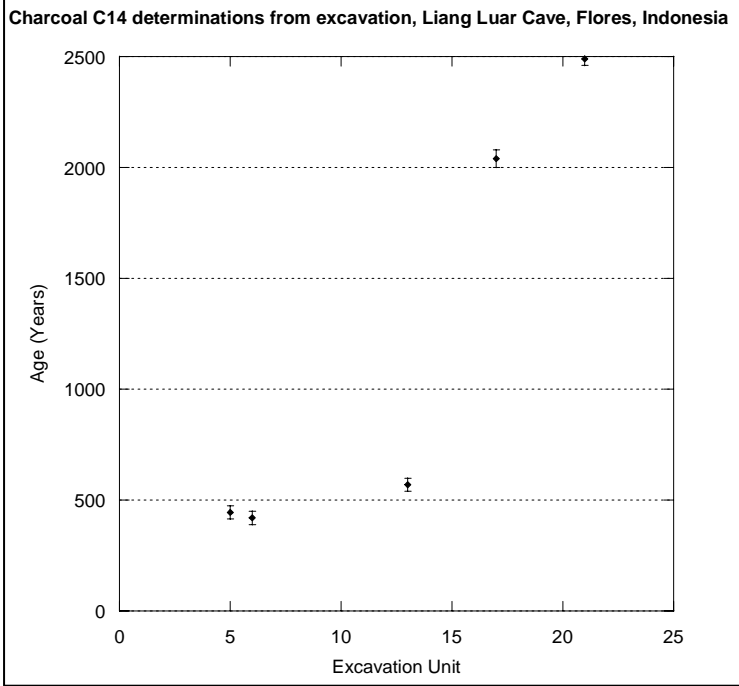
The preliminary C14 ages suggest the site has stratigraphic integrity with little reworking. Initial ages suggest rapid deposition of sediments beginning at least 570 years ago with slower deposition rates prior to this time, consistent with field observations. The apparent age reversals at spit 5 and 6 are within analytical error and to be expected considering the extremely rapid deposition of soils during this period. Further C14 ages on charcoal are required to create a more robust chronology of the site and to understand the rates of sediment deposition especially between 570yrs – 2040yrs. The rapid deposition of soils in the upper units may suggest increased erosional processes associated with land clearance for agriculture. It is important we understand the initial timing of this increased sedimentation in order to elucidate the timing of increased agricultural activities

Faunal analysis of the site is ongoing. Preliminary analysis demonstrates the existence of a number of endemic species from the basal layers. *Rattus exulans* (Pacific rat) is also found throughout the sequence and is interesting that it is present much earlier than *Rattus rattus* (common black rat) which is present at the site only sporadically from spit 7 with numbers dramatically increasing around spit 4. As both species are commensal with humans the presence of *Rattus exulans* indicates disturbance of local habitats from at least 2500BP and increasing with the appearance of *Rattus rattus* after 570BP probably indicating local settlement and gardening. The rice field rat *Rattus argentiventer*, along with *Mus caroli* (Ryukyu mouse) and frog species are only found in spits 1-3. As these species inhabit wet rice habitats, it suggests a late introduction of wet rice farming in the area.

Palaeoclimate analysis of stalagmites from the same cave (Liang Luar) demonstrates a non-climatically induced vegetation change around 800BP that possibly relates to human impact on vegetation regimes through land clearance probably for agricultural activities. It is important we identify the timing of the introduction of commensal species to reconstruct the palaeoecology and understand how this relates to vegetation changes recorded in the stalagmite.

In addition to the faunal analysis of the site (Dr Ken Aplin and Ms Emma St Pierre) PhD student Vicki Thomson (ACAD, Adelaide University) has been undertaking DNA analysis from rat incisors with success in identifying ancient DNA from all levels of the excavation. This is significant considering the antiquity of basal samples in an area that usually has poor preservation conditions for ancient DNA.

DATA



C14 Results from Liang

Sample Name	Spit/Depth	C14 Age Yrs
OZL449	5	445±30
OZL448	6 (56cm)	420±30
OZL445	13	570±30
OZL575	17	2,040±40
OZL587	21 (113cm)	2,490±30

Signature of Investigator preparing the report for

After signing this report please fax this page with your signature for our files

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Date:

28 August 2009

PUBLICATIONS / REPORTS arising as a result of your work.

No publications have arisen from the work as yet.

PhD STUDENTS

Ms Emma St Pierre – Commenced PhD 18/04/06 Due to submit 30/06/10

Thesis Title: Human-Environment Interactions: A multi-proxy record of late Holocene palaeoenvironmental change