



Date electronic copy
received at AINSE:
08 March 2010

PROGRESS REPORT FOR AINGRA09008

PROJECT TITLE	Dating Human Settlement of Leeward Moloka'i, Hawaiian Islands with Marine Shell	
INVESTIGATOR(S)	Institution and Department	
Chief Investigator	Prof. Marshall Weisler	Social Sciences, The University of Queensland
Other Investigators	Dr Quan Hua -- ANSTO Prof. Jian-xin Zhao, UQ	
Students		
ANSTO Investigators	Quan Hua	
Specialist Committee	A	

SCIENTIFIC OBJECTIVES

Marine shell is rarely used for dating Hawaiian archaeological sites, as appropriate ocean reservoir corrections (deltaR) have not been available. With two previous successful AINSE grants, the spatial and temporal variability of the deltaR for west Moloka'i, Hawaiian Islands was documented by paired U-series and AMS dates for branch corals. We seek to date the lowest levels of five likely colonisation period sites on west, Moloka'i to conclusively demonstrate the efficacy of dating marine material, thus reducing the need for using wood—a problematic material with potential inbuilt age.

PROGRESS REPORT and RESEARCH OUTCOMES

We dated four archaeological sites on West Moloka'i, Hawaiian islands as these were suspected early sites. Their environmental position near the coast and behind beaches (where canoes could easily land along an otherwise rocky coastline) pointed to ideal locales for early occupations. Samples were selected from three rockshelters and one open midden site. While we proposed to date marine shell, only wood charcoal was available from the lowest layers of these sites which were excavated in 1952. The samples have been curated at the Bishop Museum (Honolulu, Hawaii) where they were loaned to Weisler for analysis. Prior to AMS analysis, the wood charcoal was identified to species and appropriate short-lived taxa were selected for dating in order to avoid the old-wood problem. The species included short-lived shrubs (*Chenopodium*, *Notortrichium* and *Euphorbia*) and the Polynesian introduced bottle gourd (*Lagenaria*). We wanted to compare these dates to more than 200 U-series dates from religious sites (small shrines to larger temples) situated along the coastlines of the west third of Moloka'i island. It was possible that dates from religious sites would date only the latter two-thirds of the Hawaiian culture-historical sequence; consequently, we needed dates from sites that, in other islands across the Pacific, typically contained the earliest cultural deposits.

The results indicate that the "typical early sites" in this leeward region were occupied during the period of construction and use of the numerous religious sites (from AD 1300 to AD 1801). These are significant results demonstrating that the long-held belief that early Pacific island sites are only located in rockshelters and coastal middens is not correct in every case. Architectural sites, such as religious shrines and temples, may be contemporaneous. At least one paper outlining the significance of these results will be submitted later this year. In another paper, the dates will be combined with the 200+ U-series dates from the region (analysis and fieldwork supported by the ARC) for a substantial paper on the development of the Hawaiian chiefdom.

DATA

	ANSTO code	Species	Sample ID	$\delta^{13}\text{C}$ (‰)	pMC	
					Value	1 σ
1	OZL949	Chenopodium Album	HRC-82	-22.4	97.32	0.40
2	OZL950	Chenopodium Album	HRC-83	-22.7	96.96	0.50
3	OZL951	Chenopodium Album	HRC-85	-23.1	97.01	0.45
4	OZL952	Chenopodium Album	HRC-90	-26.1	95.83	0.39
5	OZL953	Notortrichium sp.	HRC-91	-26.1	96.31	0.37
6	OZL954	Euphorbia Rockii	HRC-93	-11.9	97.55	0.47
7	OZL955	Lagenaria Siceraria	HRC-99	-21.9	98.85	0.43

Conventional ^{14}C age		Cal AD at 2 σ level		
BP	1 σ	upper value	lower value	Median
220	35	1641	1952	1767
250	45	1514	1951	1656
245	40	1521	1951	1661
340	35	1467	1640	1558
300	35	1488	1603	1564
200	40	1643	1952	1771
95	35	1682	1954	1841

Note: Calibration was performed using IntCal04 data and CALIB program (version 5.0.1)

PUBLICATIONS / REPORTS arising as a result of your work.

NA

PhD STUDENTS

Khaweerat, Sasiphan (completion date in 2011) The chronology and seasonality of Hawaiian settlement patterns determined by Th-230 dating and trace element analysis of coral. PhD thesis, University of Queensland.