

Declaration

The research presented here is based on original fieldwork, as well as analysis of macrobotanical assemblages excavated by the author and by other researchers in East Timor. I certify that except where it is stated otherwise, this dissertation is the result of my own original investigation.

A handwritten signature in black ink, reading "Nuno Vasco da Silva Miranda de Oliveira". The signature is written in a cursive, flowing style.

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“A noite é a nossa dádiva de sol aos que vivem do outro lado da Terra.”
(The night is our gift of sun to those who live on the other side of the Earth)

Carlos de Oliveira

“When we arrived in Timor we took the boats to the hills,
turned their keels to the sky and used them as if they were houses.
The myth remained but the rite, the training, was lost, the memory was gone.
Timor was the end of the world for us...”

Ruy Cinatti, *in Um Cancioneiro para Timor*

This work is dedicated to five persons: both my mother and my father, Ana Maria Vieira da Silva and Domingos Miranda de Oliveira, who have lasted the distance; my grandmother, Maria Adelaide Silva, from whom I gained a certain culinary appreciation that helped balance the long hours of work; my grandfather, Joaquim José Ramos da Silva, who insisted on supporting most of my higher education; and my brother and best friend, Nuno José Miguel Fontes, unexpectedly deceased in 2007. To them goes all my love and respect.

Abstract

The Archaeobotany of East Timor's early subsistence practices has not previously been the target of systematic and comprehensive research, and this is the main purpose of this doctoral thesis. The project aims at investigating early plant food management and the introduction of agriculture in East Timor, using charred plant remains from archaeological sites as a direct line of evidence.

East Timor's economy today relies mostly on subsistence farming practices, involving a diversified array of food products from different origins. Amongst the most widely distributed, maize (*Zea mays*) and cassava (*Manihot esculenta*), originated in the American tropics and are known to have been introduced after the XVI century, with the first European (Portuguese) colonial contacts. Rice (*Oryza sativa*) was most probably domesticated in eastern Asia, and is believed to have been introduced to Timor some time within the last 4000 years. Many fruits and nuts (such as *Canarium* sp., *Artocarpus* spp., the breadfruit, and *Pandanus* sp.), as well as different members of the Dioscoreaceae and Araceae families (*Dioscorea alata* and *D. hispida* yams, and taro, *Colocasia esculenta*), are also widely used and may have been so since the early- or the mid-Holocene.

The history of plant management and agricultural origins in the wider region has been mostly investigated through more indirect proxies, such as animal domesticates, pottery and pollen records. In East Timor, the first pottery and animal domesticates appear in the archaeological record around 3800-3600 BP and are generally accepted as being associated with the introduction of full agricultural practices. However, with the exception of Ian Glover's seminal work in the 1960s, very few plant remains from archaeological sites have ever been reported.

The main corpus of this project is based on the recovery, identification, and interpretation of macrobotanical plant remains recovered during two archaeological fieldwork seasons, carried out by the author in East Timor in 2004 and 2005. Macrobotanical assemblages derived from excavations by Sue O'Connor, Matthew Spriggs and Peter Veth and not previously analysed, are also incorporated in the study, and plant remains reported by Glover reassessed. With one exception – which does not contradict the general picture – results obtained confirm the absence of rice or millets in any of the excavated assemblages, suggesting that none of these crops were introduced to East Timor with the first pottery or animal domesticates. They have arrived only in a later period, possibly within the last 2000-1500 years, when the caves

investigated were no longer being systematically used for habitation purposes. The macrobotanical analysis undertaken also suggests that a range of fruits and tubers have been in use in Timor since the early- to mid-Holocene, and that plant exploitation probably goes back as far as ca. 40 ky before present.

The method of recovery of plant remains used in the field, based on comprehensive flotation and wet-sieving techniques, shows that it is indeed possible to unearth macrobotanical assemblages from tropical and semi-tropical archaeological environments. Systematic comparison between archaeological specimens and a modern reference collection, based on morphological and anatomical binomial attributes and the use of both light-powered bifocal and scanning electron microscopes, allows for positive identification of charred plant remains. The adoption of these techniques by archaeologists needs to become standard research practice across the region if we are to successfully address issues of past plant management and agricultural origins.

Acknowledgments

Canberra, Dili and Lisbon – for the past four years, my life has been lived within this geographical and sentimental triangle. The following is an expression of gratitude to a number of individuals whose friendship helped in enduring the solitudes of this research.

In the end of 2002, two colleagues at the Portuguese Institute of Archaeology where I worked left a printed email on my desk, suggesting my name to join an archaeological project in East Timor. More than 18 months later, and after being granted a scholarship, I was on the plane that would take me from Lisbon to Canberra. To them, João Zilhão and Cidália Duarte, go my first thoughts as they were the original driving force behind this project.

In Australia, both my supervisors and advisors have been of invaluable support. Sue O'Connor has been as much a friend as a supervisor. Sue shared her experience in the field and always kept her office door open to my many enquires. Matthew Spriggs' interest and knowledge on the region have granted many valuable insights into this research, either through formal meetings or in the warmth of Kava gatherings at his and Ruth's place. Andy Fairbairn moved to Queensland in 2004 but he has not neglected his role as one my advisors. I was often welcomed at his, Amanda, Rowen and Jack's place in Brisbane. Andy's friendship and guidance in the archaeobotanical part of this thesis were worth all the lonely hours spent at the microscope. Peter Bellwood, another of my advisors, was of much support in all that relates to the archaeology of the broader region, giving advice and providing some of the most obscure references – not to be found, I am sure, in many libraries.

Much gratitude goes also to colleagues and friends at the ANU: Iona Flett (who patiently helped in making many of the tables), Jean Kennedy (who gave valuable insights into the plant world and commented on drafts of most chapters), Matiu Prebble (who helped preparing the phytolith samples), Janelle Stevenson (who analysed the pollen samples from 2004), Wal Ambrose and Christian Repemeyer (who analysed the obsidian); Jean Kennedy (who read most of the final draft of this thesis, adding valuable comments); and also Andrew McWilliam, Andrew Pawley, Antoinette Schapper, Doreen Bowdery, Geoff Hope, Geoff Hunt, Janet Finch John Bowden, Judith Cameron, Mandy Mijares, Mary Clare Sweet-Kelly, Nick Porch, Sally Brockwell, Simon Haberle, Stephanie Garling, Rachel Nanson, and many others. A special word of recognition goes to Emeritus Professor Jack Golson. Jack is an inspirational presence for any PhD student in the Department, for his constant commitment, knowledge and friendship.

Acknowledgements also go to Sharon Donahue, ANH administrator. Sharon started her job in the Department one week before I arrived, and has always endured my grievances with a smile. I am also grateful to Sandie Walters, Information Technology administrator at RSPAS, for all her patience towards my informatic inabilities; to Jenny Sheehan for much dedication drawing all the maps produced at RSPAS Cartographic Services; to Tony James RSPAS Services and Building Maintenance; and to Peter Adams, Grant Rebbeck and Andrew Muirden, nightwatchmen at RSPAS and my sole company (apart from the books) throughout so many nights spent in the office; and to Adam Black for all his help in the final stages of this thesis. At the Electronic Microscope Unit, where all SEM work was undertaken, Cheng Huang and Geoff Hunter were patient and dedicated in their support, and I thank them for that.

In East Timor, I am grateful to GERTiL for more than just logistic support given during two field seasons. With Guilherme Cartaxo, Hugo Ferreira, Joana Lima and many others I spent endless hours discussing East Timor, sharing ideas and values. GERTiL became a second family in East Timor and from that experience I gained valuable insights and long lasting friendships. Sara Ribeiro and Patrícia Teixeira were also part of that group and produced some of the maps used in this thesis.

Virgílio Smith, Secretary of State for Culture of East Timor, was always enthusiastic about this project, and we engaged in various conversations on where and how to go beyond archaeological research. Five months before submitting my thesis and after a short visit to Dili I was invited to become his advisor. With that enthusiastic end in sight, the last stages of this research project became significantly less painful.

Pedro Lebre was particularly helpful in 2004 and remained a good friend throughout my stay in East Timor. Pedro left his small hotel in Dili for a week and we walked together in the mountains around the Matabian, where he was born. He was kind enough to introduce me to every *Liurai*, which made fieldwork easier and much more interesting. During six weeks in Baguia, I was welcomed at *Tio* Martinho's place where it always felt like home. Aleixo da Silva Belo (*Chefe de Suco* of Tirilolo), Augusto Belo (*Chefe de Aldeia* of Osso Ua/Uaisa), and Constatntino Baptista Belo, Manuel Pinto, Marcelino Belo and Mr. Naha Suso (traditional owners of the land where excavations in Baucau took place), were outstanding in their enthusiasm, understanding and willingness to learn and to help. Without them, the 2005 fieldwork season would have been impossible. Emma Bonthorne kindly volunteered during three weeks of fieldwork in 2005, and continued her effort later at the ANU, sorting, counting

and weighting many of the archaeological materials. Patrícia Baptista also helped for a week during fieldwork in 2005.

In Portugal, I would like to show gratitude to Livia Ferrão and Ana Cristina Roque, who kindly guided me through António de Almeida's materials from East Timor, deposited at the Center for Pre-history and Archaeology of the *Instituto de Investigação Científica e Tropical*. I would also like to thank Father Peter Stilwell, from whom I personally learned of Ruy Cinatti's dedication and passion for East Timor. We met only briefly in Lisbon in 2003, but his kind words and doctoral dissertation on Cinatti's extraordinary life, have accompanied me for the last four years. In 2006, José Mateus and Paula Queirós kindly provided access to laboratory facilities at the Portuguese Institute of Archaeology and I thank them for that.

A few people in Canberra who are out of the Archaeological *milieu* but without whom the last four years would have been much more difficult should not be forgotten. First and foremost, Helen Shelley and "the Shelleys", my true friends and family in Australia; Adelaide Lopes, my Tetun teacher and most Portuguese friend in this country; Jenny Drysdale, the first and long lasting East Timorese connection in Canberra; Dianne Roberts, my house mate; and Anne, Silvio, Juan, Luciana, Augustin, Maria, José, Régis, Lucia, Yves, Leah, Shaun, Megan and Sarah, just to mention a few from a long list of friends from across the world, who over the past years converged in Canberra to make this a more amenable experience.

This work benefited considerably from suggestions made by Ian Glover who read the first three chapters, Jean Kennedy, Matthew Spriggs and Sue O'Connor, who read and commented on various drafts of every chapter, and I am deeply appreciative to them for that.

This doctoral work was possible through a scholarship granted by *Fundação para a Ciência e a Tecnologia* (Science and Technology Foundation, Ministry of Science and Technology, Portugal), as well as support from the Department of Archaeology and Natural History, Research School of Pacific and Asian Studies, at the ANU. AMS dates for BCUM were obtained through a grant from ANSTO, and all conventional dates for BCUM and two AMS dates for Telupunu through successive grants from the Centre for Archaeological Research, at the Australian National University.



Programa Operacional Ciência e Inovação 2010
MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E ENSINO SUPERIOR

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Acronyms

AMS = Accelerator Mass Spectrometry

ANH = (Department of) Archaeology and Natural History

ANSTO = Australian Nuclear Science and Technology Organisation

ANU = Australian National University

ARC = Australian Research Council

BCU = Bui Ceri Uato (excavated by Ian Glover in the 1960s)

BCUM = Bui Ceri Uato Mane (the rock shelter test pitted in 2004 and excavated in 2005, next to Ian Glover's site, excavated in 1967)

CAR = Centre for Archaeological Research

CPA = *Centro de Pré-história e Arqueologia* (Centre for Prehistory and Archaeology)

EMU = Electronic Microscopy Unit

ETAP = East Timor Archaeological Project

FCT = *Fundação para a Ciência e a Tecnologia* (Science and Technology Foundation)

IICT = *Instituto de Investigação Científica e Tropical* (Tropical and Scientific Research Institute)

IPA = *Instituto Português de Arqueologia* (Portuguese Institute of Archaeology)

JCU = James Cook University

JIU = *Junta de Investigações do Ultramar* (Overseas' Research Body)

MAT = *Missão Antropológica de Timor* (Timor Archaeological Mission)

RSPAS = Research School of Pacific and Asian Studies

SEM = Scanning Electron Microscope

UNTAET = United Nations Transitional Administration in East Timor

UW = University of Washington