

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

**Traditional Knowledge Systems and Crops:
Case Studies on the Introduction of Kūmara (*Ipomoea batatas*) and
Taewa Māori (*Solanum tuberosum*) to Aotearoa/New Zealand**

A thesis presented in partial fulfilment of the requirement
for the degree of

Master of AgriScience
in
Horticultural Science

at Massey University, Manawatū, New Zealand



Rodrigo Estrada de la Cerda

2015



Kūmara and Taewa Māori, Ōhakea, New Zealand

Abstract

Kūmara (*Ipomoea batatas*) and taewa Māori, or Māori potato (*Solanum tuberosum*), are arguably the most important Māori traditional crops. Over many centuries, Māori have developed a very intimate relationship to kūmara, and later with taewa, in order to ensure the survival of their people. There are extensive examples of traditional knowledge aligned to kūmara and taewa that strengthen the relationship to the people and acknowledge that relationship as central to the human and crop dispersal from different locations, eventually to Aotearoa / New Zealand.

This project looked at the diverse knowledge systems that exist relative to the relationship of Māori to these two food crops; kūmara and taewa. A mixed methodology was applied and information gained from diverse sources including scientific publications, literature in Spanish and English, and Andean, Pacific and Māori traditional knowledge.

The evidence on the introduction of kūmara to Aotearoa/New Zealand by Māori is indisputable. Mātauranga Māori confirms the association of kūmara as important cargo for the tribes involved, even detailing the purpose for some of the voyages. Less conclusive is the earlier introduction of kūmara to the Pacific from South America. In the case of taewa, both traditional Māori knowledge and early literature confirm the potato as an introduction during the first decade of recorded European contact.

The aim of this thesis was to look to various knowledge sources and determine what can contribute to a discussion around the early introduction of key food crops to Aotearoa / New Zealand and also to understand the most important factors affecting each crop's mode of introduction, assisted or not.

Various key factors which clearly define the Māori relationship to these foods have been identified. These include: the conduit the crops provided in determining and continuing a relationship between cultures across the South Pacific and including the South American continent and cultures; the contribution of scientific knowledge from western science including oceanography, ethnography, ethnobotany and horticulture generally; the perceived importance of these crops as witnessed at the time of European contact, by both the Spanish and Portuguese in the wider Pacific region, and subsequently the British, French, and other peoples including their missionary cohorts in Aotearoa / New Zealand, and; the extended value of these crops to the endurance of Māori culture (physically, socially and spiritually). Both crops retain an importance to Māori society which is beyond doubt.

Acknowledgements

Firstly, I would like to acknowledge all the people who guided me on the mātauranga Māori component of this work. Some are listed at the end of this thesis as mātauranga mentors; however, many others who are not listed have also greatly contributed with their insight and knowledge. I deeply appreciate your trust and the time you shared with me.

Special thanks to Nick Roskruge, who shared with me some of his extensive knowledge on Te Ao Māori. He also introduced me to the people who would be the main source of traditional knowledge for this thesis. This work would not have been done without his immense contribution.

Also, I extend my gratitude for the people all around New Zealand who supported and welcomed me during my stay in New Zealand. I greatly appreciate the friendship developed with the members of Tahuri Whenua. I also thank the people at Te Puni Kōkiri, Palmerston North and Wanganui. And I express my gratitude and affection for the various persons that have become my family in New Zealand.

Thanks to the government of New Zealand for funding my studies and providing me this irreplaceable opportunity to live in the country for two years. Also thanks to the staff at Massey University and also the various herbarium collections around the country who have helped me during my studies and writing process.

I extend my gratefulness for my family in Guatemala.

Table of Contents

Abstract.....	ii
Acknowledgements.....	iii
1 Introduction	1
1.1 Introduction	1
1.2 Background	2
1.3 Research objectives:	4
1.4 Case studies	4
1.5 Chapter overview.....	5
1.5.1 Chapters	5
2 Materials and Methods.....	7
2.1 Introduction	7
2.1.1 Pacific Islands / Pacific Rim	8
2.2 Kaupapa Māori Research (KMR)	8
2.2.1 Tahuri Whenua.....	11
2.2.2 Ethics approval.....	11
2.3 Māori knowledge and Māori science.....	11
2.4 Ethnobotanical framework	13
2.5 Applied Scientific Theory	14
2.6 Participatory research approaches	15
2.7 Case study methodology.....	16
2.7.1 Case Study Data collection.....	17
2.7.2 Literature review.....	17
2.8 Spatial factors.....	18
3 Polynesian Settlement and Discovery.....	20
3.1 European Discovery of Polynesia and New Zealand.....	20
3.2 Original Colonisation of Polynesian	25
3.3 Sailing Routes and Technologies.....	29
4 Food Plants and Domestic Animals Dissemination in Polynesia.....	38
4.1 Polynesia settlement.....	38
4.2 Mātauranga Māori on crop associations	42
4.2.1 Karaka (<i>Corynocarpus laevigatus</i>).....	43
4.2.2 Hue (<i>Lagenaria siceraria</i>)	44
4.2.3 Uwhi/Uhi (<i>Dioscorea alata</i>).....	44

4.2.4 Aute (<i>Broussonetia papyrifera</i>).....	44
4.3 Conclusion.....	45
5 Kūmara.....	46
5.1 Origin and Characteristics.....	46
5.1.1 Traditional Knowledge around Kūmara in the Andean Region.....	48
5.2 Kūmara dissemination in the Pacific.....	49
5.3 Kūmara Introduction into New Zealand.....	52
5.3.1 Tribal or local knowledge.....	52
5.3.2 Whakapapa.....	53
5.4 Kūmara Production in New Zealand.....	65
5.4.1 Kūmara Production before European Contact.....	65
5.4.2 Kūmara Cultivations before European Contact.....	70
5.4.3 Kūmara Production in Recent Times.....	70
5.5 Kūmara Varieties in New Zealand.....	71
5.6 Conclusion.....	73
6 Potato.....	74
6.1 Origin and characteristics.....	74
6.1.1 Traditional knowledge around the Potato in the Andean Region.....	77
6.2 Potato dissemination.....	80
6.3 Potato Introduction into New Zealand.....	82
6.4 Potato Production in New Zealand.....	88
6.4.1 Potato Production during Early Contact.....	88
6.4.2 Potato Cultivations and Trade during Early Contact.....	93
6.4.3 Potato Production in Recent Times.....	97
6.5 Taewa and Potato Varieties in New Zealand.....	98
6.5 Conclusion.....	101
7 Discussion.....	103
8 Conclusion.....	109
Glossary.....	111
References.....	112
Personal Communications.....	125
Mātauranga Mentors.....	126
Appendices.....	127

List of Tables

Table 1: Framework for a Māori Centred Research Framework - Adapted from Durie, 1996.....	10
Table 2: Vernacular Names of Sweetpotato in the Pacific - Adapted from Roskruge, 2014	50

List of Figures

Figure 1: Map of Main Locations Mentioned in this Thesis.....	19
Figure 2: Dauphin or Harleian world map, 1547.....	21
Figure 3: Map of Various Places in New Zealand Mentioned in this Work.	23
Figure 4: Map of Polynesian Triangle. Source: Shutler and Shutler, 1975.	27
Figure 5: Currents around Galápagos Islands. Source: Ader,2000.	33
Figure 6: Map of the South Pacific Gyre. Source: United States Army (1943).	34
Figure 7: Fragment of Waka at Pōhara, Golden Bay. Source: Tim Mackrell (in Khan, 2014).	36
Figure 8: Region of Malesia. Source: Author.	39
Figure 9: Micronesia, Melanesia, and Polynesia. Source: The Australian National University.	41
Figure 10: Kūmara in flower, at a kūmara garden in Perú. Source: N. Roskruge.	47
Figure 11: Spring at Wai-o-Turi, Pātea, South Taranaki. Source: Author.	57
Figure 12: Commemorative plate at Wai-o-Turi. It reads: “Pararakite Uru, puna wai matara a Turi me Rongo Rongo.” Source: Author.....	57
Figure 13: Depiction of the great bird on which Pourangahua rode back to Aotearoa. Carving at the meeting-house at Manutuke, Gisborne. Source: “How the Kūmara Came to Aotearoa”, 1962.....	62
Figure 14: Carved Panels that decorated the interior of a pātaka in Motunui, Taranaki. Source: Motunui taonga back with Te Ātiawa, 2015.....	66
Figure 15: Contemporary pātaka at Pipiriki, Wanganui River. Source: Author.	67
Figure 16: Map of Northland, New Zealand. Source: “Location Map for Northland”, n.d.....	71
Figure 17: Typical Andean highland landscape, near Pisac, Perú. Source: N. Roskruge.....	75
Figure 18: Map of Chile and distribution of Solanum species. Source: Contreras & Castro (2008).....	79
Figure 19: Ozette cultivar grown by the Makah people, at Neah Bay, Washington, USA. Source: N Roskruge.....	82
Figure 20: Map of New Zealand from Cook, D’Urville, Duperry & Herd, with additions by Polack, 1848. Source: Polack, 1976.	91
Figure 21: Stone representation of Rongo-marae-roa, from Te Ātiawa. Source: N. Roskruge.	94
Figure 22: Depiction of Potatoes at Te Rau Aroha o Te Waipounamu wharenuī, Ōmaka marae, Blenheim. Source: N. Roskruge.....	95
Figure 23: Selection of taewa varieties. Source: N. Roskruge	101
Figure 24: View of an ordinary New Zealand Pa with potato plantations around it [1845]. Painting by Cyprian Bridge [1807-1885], Courtesy of Alexander Turnbull Library, Wellington, New Zealand (REF A-079 031)	108

1 Introduction

*He kai nā te tangata, he kai tītongitongi kaki;
He kai nā tōna ringa, tino kai, tino mākona noa.*

Food from another is little and stings the throat;
Food of a man's own getting, is plentiful, sweet, and satisfying¹

1.1 Introduction

This thesis aims to investigate the relationship of Māori – as a people – to key food crops, specifically the kūmara and taewa, both seasonal crops which were essential for the survival of communities in pre-colonial times. The relationship is one which has many contributing factors, not least the knowledge base which surrounds each crop; including relationships to a wider community of interest e.g. the Pacific communities. As the influence of contemporary knowledge systems and influences on cultural systems become more entrenched there is a need to consider the opportunity to gather what remnants of traditional knowledge is still evident, alongside that knowledge which is available from other spaces – including other non-Māori cultural sources, and create discussion which can facilitate our understanding of these crops. The aim of this thesis therefore is to look to these various knowledge sources and determine what can contribute to a discussion around the early introduction of key food crops to Aotearoa / New Zealand with a view to understanding the most important factors affecting each crops' mode of introduction, assisted or not. It is also an opportunity to compare or contrast the types of knowledge; traditional, scientific, and/or social science with a view to creating a fully multi-dimensional discussion.

One of the most satisfying aspects of this research is the opportunity it provided to interact with Māori communities around the country and to build relationships with these same communities relative to their relationship with favourite foods. In particular Te Ātiawa, an iwi of the Taranaki region with satellite groupings in the Wellington, Te Tau Ihu (Northern South Island) and Chatham Islands took it upon themselves to support me as an external researcher and the project from their cultural standing. The emphasis on these two foods, traditional knowledge and systems therefore has been drawn together with the natural cultural bias of the Te Ātiawa iwi but is not

¹ Traditional whakataukī or proverb given for this thesis from Te Ātiawa Kaumātua (Taranaki).