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THE PRESERVATION OF MĀORI TEXTILES: COLLABORATION, RESEARCH AND CULTURAL MEANING

Keywords: Māori, textile, plant identification

ABSTRACT

Māori artefacts discovered in 1895 at Puketoi Station, Otago, South Island New Zealand, were re-examined using multiple methods to gather information of relevance and meaning to contemporary Māori culture. This paper discusses aspects of an interdisciplinary project including conservation treatment, plant material identification and examination of textile structure and details of cultural information thus uncovered. One artefact, the *pukoro kete*, or tutu-berry bag, is used as a case study to illustrate how knowledge uncovered about past material culture in collaboration with traditional owners can influence contemporary cultural practice and aid in affirmation of distinctive cultural identity.

RÉSUMÉ

Des objets maoris découverts en 1895 à Puketoi Station, Otago, Île du Sud de la Nouvelle-Zélande, ont été examinés une nouvelle fois à l'aide de méthodes multiples afin de recueillir les informations pertinentes et significatives vis-à-vis de la culture maori contemporaine. Cet article discute des aspects d'un projet interdisciplinaire qui englobe le traitement de conservation, l'identification des matériaux végétaux et l'examen de la structure du textile, ainsi que des détails des informations culturelles ainsi découvertes. Un des objets, le *pukoro kete*, ou sac à baie de tutu, donne lieu à une étude de cas pour illustrer comment des connaissances dévoilées à propos d'une culture matérielle du passé, en collaboration avec ses détenteurs traditionnels, peut influencer la pratique culturelle contemporaine et contribuer à affirmer une identité culturelle distincte.

RESUMEN

Objetos maoríes descubiertos en 1895 en la estación de Puketoi, en Otago, en la isla sur

INTRODUCTION

In 1895, the Puketoi Station assemblage of Māori artefacts was discovered in Otago, New Zealand. An interdisciplinary project aimed to preserve the information they contained. The project participants represented the disciplines of archaeology and museology (White), Māori weaving and culture (Te Kanawa: Ngāti Maniapoto, Waikato, Ngāti Tūwharetoa, Ngāti Raurua), and textile science and conservation of cultural material (Smith). A full description of all the Puketoi artefacts and associated information lies outside the scope of this paper and is reported elsewhere (White, Smith, and Te Kanawa, submitted). Instead, one artefact, the *pukoro*, will provide a case study by illustrating aspects of the project and implications of these for maintenance of Māori cultural identity. Conservation treatment, plant material identification, examination of textile structure and collaboration, all uncovered important cultural information, ultimately adding to knowledge about pre-contact South Island Māori.

BACKGROUND

In 1895, a cache of predominantly textile and textile-related artefacts were found in a cave on Puketoi Station, in Central Otago (Figure 1) (Hamilton 1896). With the exception of a few artefacts, the Puketoi Station objects were accessioned by Otago Museum, Dunedin, in 1924 (White, Smith, and Te Kanawa, submitted).

The assemblage consisted of a large *kete* (bag) containing the other artefacts (Figure 2). These included smaller bags, strips of dog skin, ochre, unfinished weaving, a whitebait (*Galaxiids*) net, two pairs of sandals, and various weaving materials such as fibre from New Zealand flax (*Phormium tenax*). The assemblage was interpreted by Hamilton (1896) as the bag of a weaver, containing everything necessary to produce a high-status garment, such as a cloak. While some objects undoubtedly attest to the skill of an accomplished weaver, this group of artefacts also provides information about the economy and technology of pre-contact South Island Māori.

The *pukoro kete*, or tutu berry bag (D24.589), is a small finely woven bag, coloured a deep red (Figure 3). Māori informants from Puketeraki (Figure 1) had identified it as used to extract juice from tutu berries (*Coriaria spp.*)

de Nueva Zelanda, fueron examinados de nuevo por medio de diversos métodos con el objetivo de recopilar información que resulta relevante y significativa para la cultura maorí contemporánea. Este artículo analiza los aspectos de un proyecto interdisciplinario en el que se incluye el tratamiento de conservación, la identificación de materiales vegetales y el análisis de la estructura textil, así como detalles sobre información cultural descubierta a raíz de estos estudios. Un objeto, el *pukoro kete*, o saco para bayas de *tutu*, sirve como estudio de caso para mostrar cómo los conocimientos descubiertos sobre la antigua cultura material, en colaboración con propietarios tradicionales, pueden influir en las prácticas culturales contemporáneas y ayudar a reafirmar la identidad cultural distintiva de un grupo.

(Hamilton 1896). As pre-contact South Island Māori subsisted largely on protein, the juice from tutu berries provided a highly desirable source of carbohydrate. However, tutu berry seeds were extremely poisonous. Juice was extracted safely by squeezing berries in tightly woven bags, the liquid passing through the weave, leaving poisonous seeds behind. At the time of discovery, however, the *pukoro* contained *kokowai* (ochre) (Hamilton 1986). Speculation about the purpose of the bag led to questions about whether colouration was the result of staining from tutu juice extraction, or from carrying ochre.



Figure 2
Kete (D24.574). Image © Otago Museum

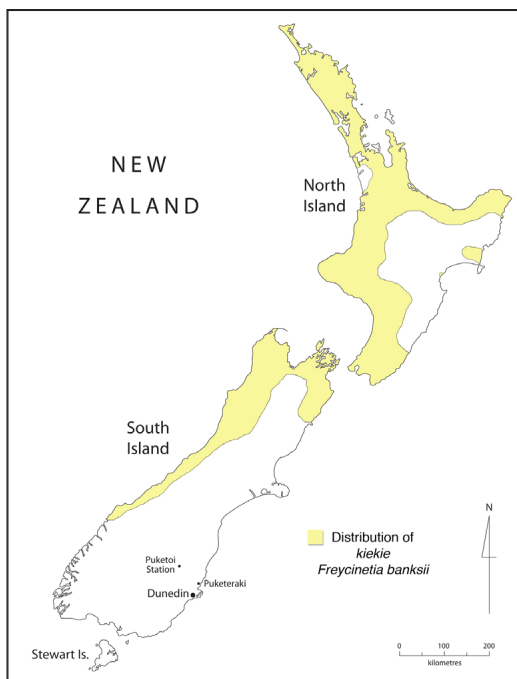


Figure 1
Map of New Zealand, showing distribution of *kiekie* (*Freycinetia banksii*)

COLLABORATIVE RESEARCH: WHY IS IT IMPORTANT?

Māori are the indigenous people of Aotearoa New Zealand. European contact with New Zealand was first made in 1642 (Abel Tasman) and by the mid-19th century systematic European colonization had begun (King 2003). The Treaty of Waitangi (1840) between Māori and the British Crown established Māori as British subjects, and is considered the founding document of a bicultural New Zealand, with Māori and Pākehā (New Zealanders of British descent), the two founding cultures with equal rights (Tamarapa 1996). The interpretation and manifestations of biculturalism are manifold and varied, but include recognition of *Te Reo Māori* (Māori language) and bicultural service delivery by public institutions, like museums (Butts 2003).

Recognition of the Treaty of Waitangi, specifically Article II, acknowledges the particular relationship and responsibilities Māori have towards *taonga*, and that *taonga* have special intangible and spiritual values best understood by Māori. *Taonga* are ‘all dimensions of a tribal group’s estate, material and non-material’ (Kawharu 1989). All artefacts made by Māori, historic and contemporary, are *taonga* and embody important intangible aspects of Māori culture (Tapsell 1997).

They [*taonga*] are anchor points in our genealogies and in our history. Without them we have no position in society and we have no social reality. We form with them the social universe of Maoridom. We are the past and the present and together we face the future. (Mead 1985, 13, as cited in Hakiwai 1988).

Furthermore, neither *taonga* nor Māori cultures are static or unchangeable. Museum collections and presentations of *taonga*, oft-times as ethnographic evidence from the past, have been criticized for not recognizing the web of contemporary cultural meaning and relationships implicit in *taonga* (for example see Te Awekotuku 1988; Wood et al. 2003).

The clear implication is that Māori should be directly involved with *taonga* held in museum collections. The New Zealand Conservators of Cultural Material (NZCCM) code of ethics specifies that Māori have special knowledge of, and responsibility for, *taonga*, without providing prescriptive information about how to ensure involvement. Different processes of ensuring Māori participation are followed at every museum (for further discussion of consultation see Smith and Scott 2009). At Otago Museum, proposals for *taonga* are assessed by the Māori Advisory Committee, a group comprised of representatives from local *runanga* (tribal councils) (Smith and Winkelbauer 2006). In the case of this project, a highly acclaimed contemporary weaver, Kahutoi Te Kanawa, was also asked to be involved.



Figure 3

Pukoro kete (D24.589) after conservation treatment (toned paper repairs visible in corners). Image © Otago Museum



Figure 4

Pukoro kete (D24.589) before conservation treatment. Image © Otago Museum

CONSERVATION TREATMENT

The conservation treatment of the *pukoro*, carried out some years prior, enabled examination for the interdisciplinary project. Prior to treatment the *pukoro* was in a parlous state and could not be handled (Figure 4). Plant materials were embrittled, and shedding from the artefact. The bag structure had collapsed obscuring areas of the *kete*, and horizontal lines provided evidence of folding, with associated loss. There were extensive areas of fabric loss along the sides and base of the bag. The *kete* handle appeared to be detached from one side of the bag.

In order to handle the bag, interventive conservation treatment was required. After surface cleaning, the *pukoro* was progressively re-humidified in a chamber, and its original shape re-instated by blocking using gradually larger Tyvek-covered pads of polyester batting. Fold lines were reduced by weighing down onto underlying supports with small polyethylene bags of lead shot. Eventually two appropriately coloured polyester-covered pads supported the structure of the *kete*. Rather than attempting to infill, toned Japanese tissue supports (Kizugishu) were adhered to the bag interior surrounding areas of loss (rice starch paste) preventing further shedding and supporting remaining plant material without attempting to breach the large gaps in the bag. Where starch paste was ineffective, plant materials were re-adhered to the tissue using 2%w/v methylcellulose (400cps) in distilled water. After conservation treatment, the *pukoro* had re-gained structural stability, and could be handled (Figure 3). Conservation treatment revealed important information about the bag. A stitched indigenous repair, previously obscured by fold lines, was now visible. The handle, previously thought to be damaged, had clearly only ever been attached at one side of the bag.

Achieving object stability meant examination of the *pukoro* for the current project was possible. In this way, interventive conservation treatment provided access to previously obscured Māori traditional knowledge, embodied in the plant materials used, and the textile construction of the bag.

OBJECT ANALYSIS METHODS

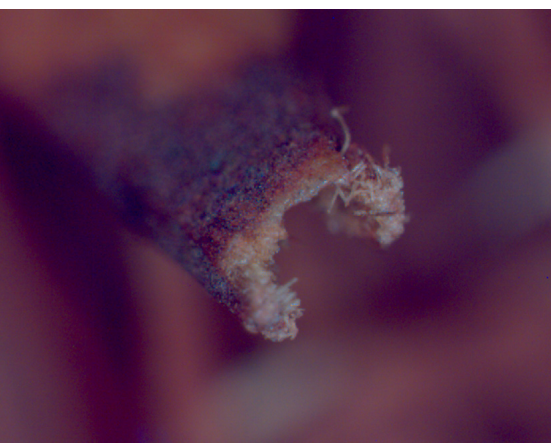
Plant materials identification

The identification of plant materials used was important for a number of reasons. Characterization of the materials from artefacts provides important cultural data about technological capabilities and enables appropriate documentation. Sometimes plant use is dictated by tradition, efficacy, or availability, in turn dependent on climate, trading partnerships and the ability to cultivate. Evidence of the valued nature of plants is also provided if they have been traded widely (Norton 1990).

However, the accurate identification of many plant materials, particularly when processed and aged, i.e., in the form they are found in artefacts, is extremely difficult. While all plant materials have physical and chemical characteristics that enable their identification, many have very similar features, particularly when relying on visual methods of identification. Natural diversity and climate variation will impact on properties displayed by any plant. Once processed and aged, these diagnostic characteristics, physical, structural and chemical, are also likely to be significantly altered (Carr, Cruthers, Smith et al. 2008).

Often viewing the surface of plant materials using microscopy or viewing transverse sections of them can aid in identification, if the particular characteristics of the plant are known. An online atlas of plant materials used to construct artefacts in the Pacific and New Zealand was developed providing reference images showing diagnostic features (physical characteristics, average fibre diameter, ultimate fibre length, etc.) to enable easier identification of plant materials (Carr, Cruthers, Girvan et al. 2008; <http://www.otago.ac.nz/textiles/plantfibres/index.html>). Cross-sections were made¹ of samples from the Puketoi artefacts, and slides prepared for viewing to identify diagnostic features as displayed in the plant materials atlas. Otago Museum policy required that sample material could not be removed directly from artefacts. Instead, small pieces of plant material that had detached over time were used for identification. Exterior surfaces of samples were also viewed using scanning electron microscopy (SEM), and compared with reference material. Plant materials (surfaces, cut/broken ends) were also viewed and photographed in situ using an optical microscope. It is important to note, however, that reference images were of non-processed and non-aged samples of material. Current work is attempting to extend the atlas to include images of plant materials that have undergone common processing procedures, and images of samples derived from Māori artefacts.

Hamilton (1896) had stated thin pieces of ‘some leaf’ were the likely materials of construction for the *pukoro*, while Te Kanawa thought this was *kiekie* (*Freycinetia banksii*). Examination of samples using SEM (bonded dirt obscured leaf surface) and viewing cross-sections (no internal diagnostic features discernable) did not confirm that *kiekie* was present. Fortunately, *kiekie* has a distinctive horseshoe-shape in cross-section, which was clearly visible in in-situ micrographs (Figure 5). Microscopy also showed that the *kiekie* was heavily coated with a discrete layer of ochre, responsible for the red colouration of the bag, rather than tutu berry juice extraction.



Other New Zealand plant materials were also identified in the artefact assemblage in similar ways: New Zealand flax (*harakeke*, *Phormium tenax*), mountain daisy (*Celmisia viscosa*), and cabbage tree (*tī kōuka*, *Cordyline australis*). Most Māori artefacts held in cultural institutions are considered made from *harakeke*, despite ethnographic evidence indicating pre-contact Māori used numerous materials to construct textiles. Identification of a number of plant species present in the Puketoi Station textiles helped develop a more accurate and resonant picture of pre-contact textile tradition within New Zealand.



Figure 5

Cross-section of *kiekie* (*Freycinetia banksii*) from *pukoro kete* (D24.589) showing characteristic horseshoe shape

Figure 6

Detail, weave *pukoro kete* (D24.589). Image © Otago Museum

Moreover, the identification of plant materials showed exploitation of resources from far-flung geographic regions. In the case of the *pukoro*, *kiekie* is found a significant distance (Figure 1; at least 350–400 kms) from the find site. *Kiekie* can be harvested January to early March, or late August to October. Thus plant identification provides information about cultural boundary, possible trade relationships, societal complexity and resource procurement by pre-contact South Island Māori.

Identification of the plant material used also enabled Te Kanawa to elaborate on processing required to produce the materials to make the *pukoro*. Prior to weaving the preparation of *kiekie* is labour-intensive; leaves are stripped, boiled, and sun-dried to bleach the strips to an off-white colour.

Artefact structure, form and function

Technical analysis (weave diagrams, identification of structural features, and relationship to material choice), and ethnographic research together with *tīkanga* (traditional knowledge) were used to determine the possible function of the Puketoi Station artefacts. The ability to confirm the *pukoro* fulfilled its reported purpose was of particular interest.

The weave structure of the *pukoro* was extremely complex, with fine strips of *kiekie* (width 2 mm) worked in balanced 3/3 twill, identified by Te Kanawa as a horizontal weave called *takirua* (in pairs) and a vertical weave called *whakatutu* (standing up) (Figure 6). A weave diagram was also constructed by Smith to clarify the complex structure. At the mouth of the bag were two rows double-paired twine (*whatu-rua*) woven using fibre from *harakeke*. Another feature of the *kete* was a long plaited handle made from *harakeke* fibre, attached to only one side.



Figure 7
 Replication of the *pukoro kete* by Kahutoi
 Te Kanawa

On the basis of examination of the bag, attempts were made to determine whether it was in fact a *pukoro* as indicated by Māori informants. Te Kanawa reported that *kete* for squeezing tutu berries (*pū tutu*) more commonly had a funnel shape. Extant examples of tutu berry *kete* at Auckland Museum were unlike the *pukoro*: not coloured, made of New Zealand flax, and all were cylindrical with long plaited handles extending from each end for twisting the bag (Clarke 2009).

Despite not being like other bags used for tutu berry juice extraction, the structure, materials and form of this *kete* do not preclude its use for the purpose. The structure would make the bag both flexible and capable of expansion with strength to withstand twisting. *Kiekie* was valued for its durability, strength and water resistance: a good choice for this purpose. The different weave structure at the mouth prevented the opening from stretching, and would act to retain the shape of the bag. The long handle could have been used to wind around the mouth to close it prior to squeezing. A long tear in the bag was meticulously repaired with plant fibre string. As the bag was discovered filled with ochre, it is possible that its use changed after damage (White, Smith, and Te Kanawa Submitted).

The *pukoro* is an example of rare and complex weaving, providing evidence of advanced adaptation to the plants of New Zealand, far-ranging exploitation of available resources, and sophisticated technological specialization. The intricate nature of the design and fineness of weaving strips used clearly represented the work of an accomplished weaver. While this is apparent to even the non-weaver, the exceptional quality of the work and knowledge implicit in the materials and weaving, required founder culture knowledge to be fully appreciated.

Te Kanawa reported that *kiekie* has strong fibre, stripped from the two sides of the spine of a single leaf blade. When fibre is removed from the blade, the remaining spine measures approximately 2 mm: the same width as the *whenu* (warp) of the *pukoro*. Many years of craft specialization are implicit in learning the *tikanga*, or cultural protocols, for harvesting and preparation of plant materials for such a *kete*, as the ‘finished product is dependent on the preparation of the materials’ (Te Kanawa 2006). To this end, the weaver works painstakingly to ensure regularity in size of plant material and pattern, using a *haehae* (measuring tool), or parts of the body (Te Kanawa 2006). The geometric patterns found in *kete* are memorized rather than drafted from a pattern, and relate to *atua* (the gods) and *whenua* (the land) creating a *whakapapa* (genealogy) for each *kete*:

These are the types of skills that are inherited through practice and working alongside *tohunga kairaranga* (experienced weavers). It is only through determination, commitment and hours of patience that an apprentice weaver gets to work alongside the *tohunga kairaranga*. (Te Kanawa 2006)

Te Kanawa found the intricate pattern of the *pukoro* and fineness of *kiekie* strips made replication of the bag extremely challenging (Figure 7). The

processing of the *kieke* required was also time-consuming and difficult, and work required spiritual preparation:

I needed spiritual guidance and support, not being *manawhenua* (a person born of the area) I made sure to perform my own *karakia* (blessings) before commencing. This was in essence my own realization of respect and honour for the weaver who made the *pukoro*. (Te Kanawa 2010)

Through the creation of the ‘new’ *pukoro*, and weaving demonstrations given by Te Kanawa, this project has enabled rare and complex traditional methods of artefact construction to be communicated to contemporary communities.

CONCLUSION

Interdisciplinary examination of the Puketoi Station artefacts led to a number of important outcomes. In particular, examination of the *pukoro* shows how conservation and conservation-related activities (identification of plant materials, form and structure of artefacts) can provide important cultural information. Interventive conservation treatment of the *pukoro* made handling, and therefore examination, possible. Plant materials identification enhanced understanding of pre-contact economies in the South Island of New Zealand. Analysis of weave structure, form, and materials of the *pukoro* enabled a Māori weaver to replicate the bag, assisting in revival of past cultural practice. Additionally, this project explicates advantages of involving founder-culture practitioners in examination of cultural material held in museums, showing the enhanced depth of knowledge gained.

Without collaboration combining the knowledge and skills of traditional owners and contemporary techniques of analysis and conservation, information contained within this assemblage of artefacts would not have been accessible. In this way, the Puketoi Station interdisciplinary project made possible the preservation of aspects of Māori cultural identity. *Taonga* have ‘connections to people, places and times that can summon up the most passionate and intimate associations, the very substance of identity’ (Wood 2003, 85).

Through examination and replication of the *pukoro*, links have therefore been made between *taonga* and the living culture of the people who made it.

ACKNOWLEDGEMENTS

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NOTES

- ¹ Samples were fixed with Tellyesniczky's formula, stained with haematoxylin (C₁₆H₁₄O₆) and eosin (C₂OH₆Br₄Na₂O₅), embedded in paraffin wax, and cut into transverse sections by an experienced histologist.

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MATERIALS LIST

Rice starch
Conservation Supplies
www.conservationsupplies.co.nz

Japanese tissue (Kizugishu)
G. Websters & Co. Ltd
44 Manners St., Wellington, New Zealand

Polyester batting, polyester fabric
Spotlight StoresLtd
www.spotlight.co.nz

Methylcellulose (400 cps)
Dow Chemical (NZ) Ltd
www.dow.com