

10. TE REO TIPU KAUPAPA MĀORI VIEWS OF MOLECULAR RESEARCH WITH RĀKAU RONGOĀ O NGĀ REPO USED FOR TYPE II DIABETES (T2D)

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NGĀTI WHĀTUA)

Ngā mihi

Introduction

Whakapapa of Te Reo Tipu

My journey as a kairongoā and molecular scientist

What can we do to support the protection and
enhancement of mātauranga about our valued rongoā?

Want to learn more?



Ka ora te whenua, ka ora te tāngata

If you heal the land, you heal the people

Kingi Tāwhiao Te Wherowhero (Waikato)

Ko Taupiri te maunga
Ko Waikato te awa
Ko Pōtatau Te Wherowhero te tāngata
Waikato Taniwharau!
He piko, he taniwha
He piko, he taniwha
Ko Tainui te waka
Ko Ngāti Whāwhākia te hapū
Ko Te Ohaaki, ko Maurea ngā marae
No Rāhui Pōkeka ahau

I would like to acknowledge my whānau especially my husband, tamariki, parents and siblings. With the Lord's hand, none of this would have been made possible.

I would also like to acknowledge Pa Ropata (Robert McGowan) and whaea Marilyn Vreede for your teachings and guidance, Te Kāhui Rongoā Trust for their tautoko and Health Research Council for funding my rangahau. I would also like to acknowledge my academic mentors Prof Peter Shepherd, Prof Vic Arcus, and Prof Linda Tuhiwai Smith.

– Ngā mihi, nā Jonni

Indigenous flora in Aotearoa New Zealand are among the most unique and diverse in the world. A high proportion (70–80%) of indigenous flora is endemic to Aotearoa, and not found anywhere else on earth. Many of these have rongoā medicinal properties that our tūpuna (ancestors) have used for centuries, providing relief for many common illnesses and conditions. As a result, Māori view indigenous flora as taonga (treasure), with associated values and responsibilities related to kaitiakitanga (exercise of guardianship) and rangatiratanga (right to exercise authority). These values especially hold when it comes to their use and sustainability for future generations.



Aongotete wetlands (Bay of Plenty) surrounded by native plants. Photo: Jonni Koia

Te Reo Tipu comes from the understanding that rākau rongoā (Māori medicinal plants) have a unique voice. We understand rākau rongoā has an intelligence of its own, and quite often can speak to you, teach, guide and protect you. If you mahi (work) with our rākau rongoā long enough, you will develop a sense of this. The primary role of rākau rongoā is to nurture and heal the whenua (land), often appearing at the fringes of land that has been damaged. As pōtiki (the youngest child of Tāne Mahuta), it is our responsibility to take care of our rākau rongoā and guide how it is used. Te Reo Tipu is, therefore, about understanding the role rākau rongoā has for healing Papatūānuku (Earth mother) and the importance of acknowledging Tāne Mahuta (God of the forests and birds) for the gift given.

Repo (wetlands) are well recognised by Māori and non-Māori for their role as rākau rongoā for the whenua and wai (freshwater). They are often referred to as the 'kidneys' of the natural world for their ability to cleanse and filter harmful pollutants from surrounding catchments before they reach our waterways. Coastal and riparian repo can buffer the whenua from rough wave action and flooding. Around the edges of our repo – tucked among the swamp forests, or where the repo graduate to dry land – are valuable rākau rongoā. They are not only important for the treatment of serious human ailments, but also for maintaining structural habitat surrounding repo and wai systems. In their own right, rākau rongoā can act as important tohu (indicators) of ecosystem or habitat changes, supporting the observable and delicate balances between whenua and wai.

My mahi with four of these rākau rongoā – karamū (*Coprosma robusta*), kūmarahou (*Pomaderris kumeraho*), mamaku (*Cyathea medullaris*), and kawakawa (*Piper excelsum*) – is explored further in this chapter. These rākau rongoā could potentially play a role in treating Type II diabetes (T2D), one of the more serious afflictions affecting a large number of our people.

Whakapapa o Te Reo Tipu

The name Te Reo Tipu was given by whaea Marilyn Vreede, a Trustee member of Te Kāhui Rongoā Trust from Whanganui. I approached her to name my rangahau (research).

It is important to me that our kaumātua (elders) are given the opportunity to fulfil their role as kaitiaki – keepers of the knowledge – and that they are actively engaged and involved in all aspects of my rangahau. This is how I believe our rongoā will be protected. My kaumātua inform Te Reo Tipu in a way that the rongoā would want and no doubt expect. Along with my kāhui kaumātua (elder committee), I am also establishing a kāhui rangatahi (youth committee) to provide interms of succession for my rangahau. Our rangatahi also have amazing foresight for the future of our rongoā.



Key mentors in my rangahau – whaea Marilyn Vreede and Pa McGowan. Photos: Lewis Gardiner (top) and Jonni Koia (bottom)

Rongoā Māori is about holistic healing and connection of a person to their wairua and restoration of mauri to Papatūānuku.

Many of our people take a holistic view: they believe that if they can restore mauri (life force) or connection with Papatūānuku, Earth Mother, this will allow them to restore their connection to their whakapapa (genealogy) and with themselves. The balance in their journey towards healing and good health is then restored.

Disease is a social issue before it becomes a health issue. Homelessness, loneliness, domestic violence, or relationship incidences are all social issues that can lead to disease. When people are lonely, they can eat too much or nothing at all. This leads to obesity or weight loss that impacts on their health. The current decline of Māori health is in many cases, due to the disconnection our People have to their whenua, including our repo.

Rongoā is more than just plant compounds that have certain medicinal effects on human physiology, as is the case with many modern medicines. Appropriate use of rongoā also supports and stimulates organs like the liver, kidney, and pancreas to heal themselves. Inspired and guided by this knowledge, many kairongoā (rongoā practitioner) use rongoā blends, in which each rongoā complements the other.



Karamū.
Photo: © Jon Sullivan



Mamaku.
Photo: © Jon Sullivan

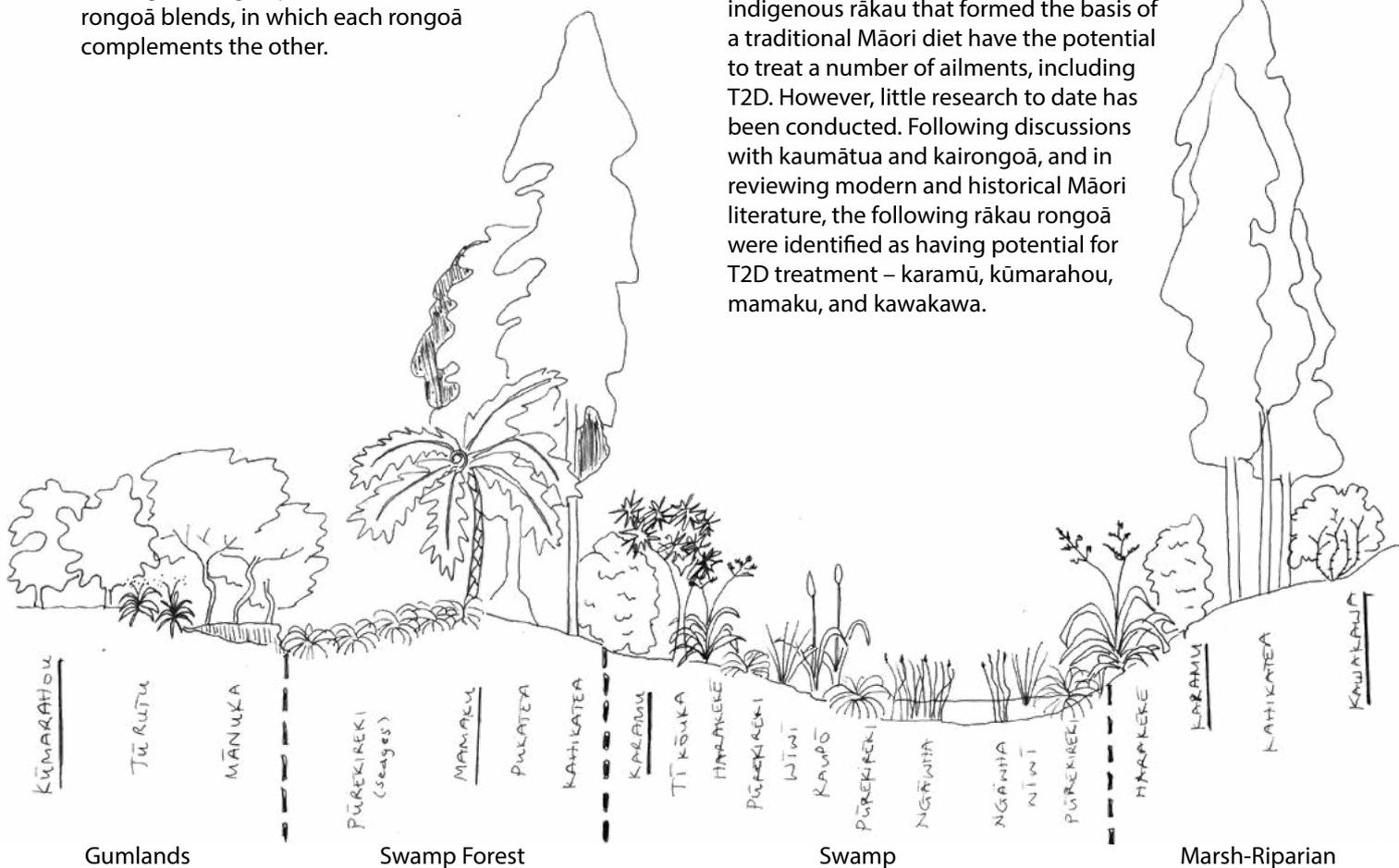


Kawakawa.
Photo: © Jon Sullivan



Kūmarahou.
Photo: © Tony Foster

Seeds, roots, nuts, and fruits sourced from indigenous rākau that formed the basis of a traditional Māori diet have the potential to treat a number of ailments, including T2D. However, little research to date has been conducted. Following discussions with kaumātua and kairongoā, and in reviewing modern and historical Māori literature, the following rākau rongoā were identified as having potential for T2D treatment – karamū, kūmarahou, mamaku, and kawakawa.



The different wetland types where the four rongoā rākau can be found. (NB: these wetland types and their associated plant species are not found everywhere. Some, like Gumlands for example, are unique to the upper North Island. Illustration: Cheri van Schravendijk-Goodman

Table 1. Rākau rongoā identified as effective treatment for Type II Diabetes (T2D)

Plant	Potential medicinal properties of interest to this rangahau	Other traditional uses	Whakapapa – where does it grow	Compatible plants it grows with in wetland environments (some examples)
Karamū <i>Coprosma robusta</i>	<ul style="list-style-type: none"> Blood sugar stabilisation Treatments related to inflammation and obesity Anti-tumour and antioxidant properties 	<ul style="list-style-type: none"> Used as kai, the mature berries can be eaten Leaves used to make tea and as part of rituals Bark used as a dye 	<ul style="list-style-type: none"> Found in both the North and South Island Common in coastal, and lowland forests, within shrublands, and open sites including swamp forests 	<ul style="list-style-type: none"> Kahikatea (<i>Dacrycarpus dacrydioides</i>) Pūrekireki, pūrei (<i>Carex virgata</i>, <i>C. geminata</i>, <i>C. secta</i>) Harakeke (<i>Phormium tenax</i>) Mingimingi (<i>Coprosma propinqua</i>) Ti kōuka (<i>Cordyline australis</i>) Toetoe (<i>Austroderia</i> spp.)
Kūmarahou <i>Pomaderris kumeraho</i>	<ul style="list-style-type: none"> Treatment of respiratory (lung) conditions Treatment of sores, wounds, rashes and skin irritations Anti-tumour and anti-oxidant properties 	<ul style="list-style-type: none"> Used like a soap Flowering period noted as a tohu – as observed in the maramataka (planting and fishing calendar) for māra kai (vegetable gardens) 	<ul style="list-style-type: none"> Only found in the North Island Coastal to lowland habitats Often found on roadside banks or in shrublands, but occasionally seen in forests Prefers full sun and nutrient poor soils 	<p>NB: Kūmarahou does not like wet feet, but can be found on the drier, higher areas around swamp forests, in gumlands, or margins of valley bottom wetlands:</p> <ul style="list-style-type: none"> Mānuka (<i>Leptospermum scoparium</i>) Kānuka (<i>Kunzea ericoides</i>) Swamp turutu (<i>Dianella haemataca</i>) Wīwī (<i>Gahnia</i>, <i>Machaerina</i>, <i>Schoenus</i> spp.)
Mamaku <i>Cyathea medullaris</i>	<ul style="list-style-type: none"> Nurtures, soothes and heals Papatūānuku when damaged Parts of the plant used for inflammations, boils, and sores 	<ul style="list-style-type: none"> Used as kai, the young fronds can be eaten Construction of rua-kumara (kumara storage pits) Used by some as a musical instrument (Jew's Harp) 	<ul style="list-style-type: none"> Found both in the North and South Island Can adapt to a variety of conditions but tends to prefer damp soils, wetland margins, and on frost free hillsides 	<ul style="list-style-type: none"> Kahikatea Pukatea (<i>Laurelia novae-zelandiae</i>) Nīkau (<i>Rhopalostylis sapida</i>) Kōwhai (<i>Sophora</i> spp.) Patetē (<i>Schefflera digitata</i>) Māhoe (<i>Melicytus ramiflorus</i>) Hoheria (<i>Hoheria</i> spp.)
Kawakawa <i>Piper excelsum</i>	<ul style="list-style-type: none"> A universal rongoā used for a range of ailments 	<ul style="list-style-type: none"> Used as kai, the orange fruits are sweet and the seeds are peppery Worn by some iwi as a head wreath during tangihanga (funeral) 	<ul style="list-style-type: none"> Found in both the North and South Islands, but more common in the North Island Prefers semi-shaded areas within free draining, moist soil Very shade tolerant, but will not tolerate frost 	<p>NB: Kawakawa doesn't like wet feet, but can be found on the drier edges of swamp forests and along waterways with:</p> <ul style="list-style-type: none"> Kahikatea Pukatea Kōwhai Māhoe Kōtūkutuku (<i>Fuchsia excorticata</i>) Hoheria Mamaku

MY JOURNEY AS A KAIRONGOĀ AND MOLECULAR SCIENTIST

'Harvesting rākau rongoā involves considering the needs of others, ensuring sustainability, being gentle with footprints, harvesting the east side of the plant by hand, never harvesting in the rain, and harvesting leaves during the growing season.'

– Dr Jonni Koia

Maōri studying and working within the contemporary scientific realm walk an interesting line. We are trained to maintain a certain structure in the way we are expected to conduct ourselves as scientists, but, at the same time, we also work hard to hold fast to who we are as individuals, and our unique identity as Maōri.

I prepare rongoā wairākau (rongoā tea) in my home for my whānau, and so, as a **kairongoā**, I personally seek to strengthen my connections with the rongoā when I visit the ngahere (forest). Key lessons that I have learned:

- Always take the opportunity to connect with Papatūānuku and give thanks to Tāne Mahuta (God of the forests and birds) for our rongoā.
- Allow the time to connect, and listen to what our rongoā are trying to teach and say to you. Sometimes its 'Ae, come here', sometimes its 'Kao, go over there', and sometimes its 'Kao, go home and come back another time.'
- Turuki Whakataha, which means to set any personal issues aside when entering the ngahere to connect with rongoā. I feel this is really important, as it allows the mind and wairua (spirit) to be clear. It is always important to understand that the role of rongoā is to heal Papatūānuku and for us as pōtiki to be responsible in our use of rongoā.

As a **molecular scientist**, the major challenge remains in the identification and confirmation of active anti-diabetic rākau rongoā extracts to support its potential as a treatment of T2D. A major objection raised by mainstream health providers is the lack of scientific and clinical research (in their opinion) to support the use of rākau rongoā. This generates a resistance to the acceptance of rākau rongoā in the community.



Dr Jonni in the laboratory preparing freeze dried wairākau extracts at various concentrations before invitro testing.
Photo: Jonni Koia

Scientific research to counter these negative attitudes towards our rongoā mātauranga can require both extraction of material from the plants, and testing on human cell lines and animals to gather the data and information required. As a scientist, I want to ensure robust testing methods. But, more importantly, as Māori, I also expect that robust cultural practices are also followed. Building on traditional kaupapa Māori methods, I also apply the same process to my mahi in the lab:

- Applying tikanga Māori (customary values and practices) and karakia (prayer) before harvesting.
- Returning any unused material back to Papatūānuku. In my lab, it is forbidden to discard unused plant material to waste or down the drain.
- When undertaking testing of rākau rongoā on animals, apply the appropriate tikanga that respects both the rongoā and the animal. Our practices such as karakia are especially important when an animal may need to be euthanised. This is a reality for this type of mahi as we try to enhance our understanding of treatment effects in both humans and across nature.
- It is also important to be aware that human cell lines in this type of research come from individuals. Each has given consent before their deaths for their cells to be used for research purposes. I always karakia before any cell culture screening is performed to ensure all involved are kept safe, and, more importantly, to acknowledge the deceased person who donated their cells. I teach all my students this very important step.



Bottles of wairākau made from kūmarahou, karamū, kawakawa, and mamaku. Photo: Jonni Koia



Kawakawa tincture soaking. Photo: Jamie Watson



Dried tātārāmoa (bush lawyer) stored in jars at home. Photo: Jonni Koia

WHAT CAN WE DO TO SUPPORT THE PROTECTION AND ENHANCEMENT OF MĀTAURANGA ABOUT OUR VALUED RONGOĀ?

Mātauranga Māori is about places, the people connected to those places, and our interactions with the whenua over many generations – it is a knowledge of the land from the people who belong to the land. It is knowledge Māori have accumulated by living on the whenua, working with the whenua, and harvesting from the whenua, while all the time listening, watching, and caring to ensure that they can continue to survive. Mainstream research (both within medicine and environmental restoration) increasingly recognises the value of our ancient knowledge, and the solutions that sit within this knowledge to solve modern-day challenges. **However, as decisions relating to our valued species and our communities adapt and grow to better incorporate mātauranga, so too does the risk of their exploitation and misinterpretation.**

The restoration of our environment is very tightly connected to discussions about our community health and well-being – especially when talking about our rongoā. Our rākau rongoā and their associated plant whakapapa often form important components of restoration planting lists, even though they may not be identified as such. As whānau become more involved in projects (including research into our native flora and fauna), it is important to ensure such projects are framed and implemented in a way that best supports your own aspirations for rehabilitating, or re-creating those spaces where your cultural practices can be supported and sustained. The mahi should be done in a way that does not compromise the integrity of the values important to you, your whānau, hapū (sub-tribe), and iwi (tribe).

Below are some key considerations to ensure your mātauranga is best supported in repo restoration, especially where rākau rongoā are concerned:

1. If you or your whānau are considering a repo restoration project, or have been approached to participate in one, it is important first, **to get a good understanding of the drivers or purpose for the project.** You are within your rights to ask project managers for the time needed for whānau to wrap their heads around a project, and for them to give you the best available information to help you reach a decision.
2. **Ensure there is sufficient time** for you all to wānanga (discuss) the ideas behind a proposal. This puts into practice your rangatiratanga, and is an important process for building your own picture of what you all wish your future to look like.
3. To help build your future picture, it is important to **acknowledge what your past picture looked like.** One idea for wānanga is to choose a time in your history, and think about the following:
 - **What did your cultural landscape look like at that time?**
Talk to your kaumātua and wider whānau about the plants, ecosystem types, animals (fish, birds, insects) that used to be in your rohe (region), especially regarding the specific project area.
 - **How did your tūpuna interact with that cultural landscape?**
Think about your practices related to harvest of kai (including historic practices such as birding [the observation of birds in their natural habitat]), collection of rongoā, materials for weaving, dyeing, carving, and building. Also, consider areas of cultural significance, such as the areas occupied by your kaitiaki (guardians), important spaces for spawning of valued fish species, and nesting/roosting areas of valued birds.
Consider what the maramataka (planting and fishing calendar) of those interactions looked like. This is especially important for times of whakatipua (regeneration) needed by valued species, in particular, rongoā and weaving plants often more at risk of being overexploited without the correct tikanga.
4. **Rākau rongoā are important for all repo restoration projects,** not only as a means of ensuring cultural practices are sustained for present and future generations, but also because of the role they play in healing the whenua and wai.
 - **Can you still interact with your traditional cultural landscape in the present day?**
If not, what needs to be returned to support those practices again? And, then the most difficult question: Is it achievable to bring all that back? Or are there compromises that need to be made? If so, what are they? What are your bottom-lines/non-negotiables?
 - **And finally, what processes need to be put in place to ensure the sustainability of those resources into the future, including your associated practices?**
Restoration does not necessarily mean that the site won't be impacted again in the future. Investigate what options there are for formal protections to be put on the land (e.g. covenants, especially if not Māori-owned). Include in those covenants, protection for your access, use, and management of those resources for the sustenance of your practices.
Also, consider how your mātauranga in relation to the project can be guaranteed the protection you expect. Your mātauranga is your own, and you have the right to ensure that the use of that mātauranga does not occur to the detriment of your people, your cultural landscapes, and the valued resources within.
 - Spend time with your kaumātua, whānau, hapū, and iwi to better understand the rākau rongoā that were recognised in your rohe. Spend time talking about **which plants appear first, and which plants come after them.**
 - This information is important for **building plant lists,** particularly if some plants are needed to first build the 'whare-ngahere' (forest house) that supports those more sensitive plants and animals that appear later. Good examples of whare-ngahere building and kōhanga plants are tutu, mānuka and kānuka, kōwhai, harakeke, and karamū and mamaku (two of the rākau rongoā discussed in this chapter). Be sure you first check with your mātauranga experts that these plants are appropriate for your rohe.



WANT TO LEARN MORE?

Note: If you are having problems with the hyperlinks below try copying and pasting the web address into your browser search bar.

References

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Useful websites

Additional information about the incorporation of rākau rongoā into gardens <http://www.o2landscapes.com/pages/pp-pomaderris.php>; <http://www.o2landscapes.com/pages/pp-coprosma.php>; <http://www.o2landscapes.com/pages/pp-cyathea.php>

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