Kawakawa extracts demonstrate anti -inflammatory activity

Introduction

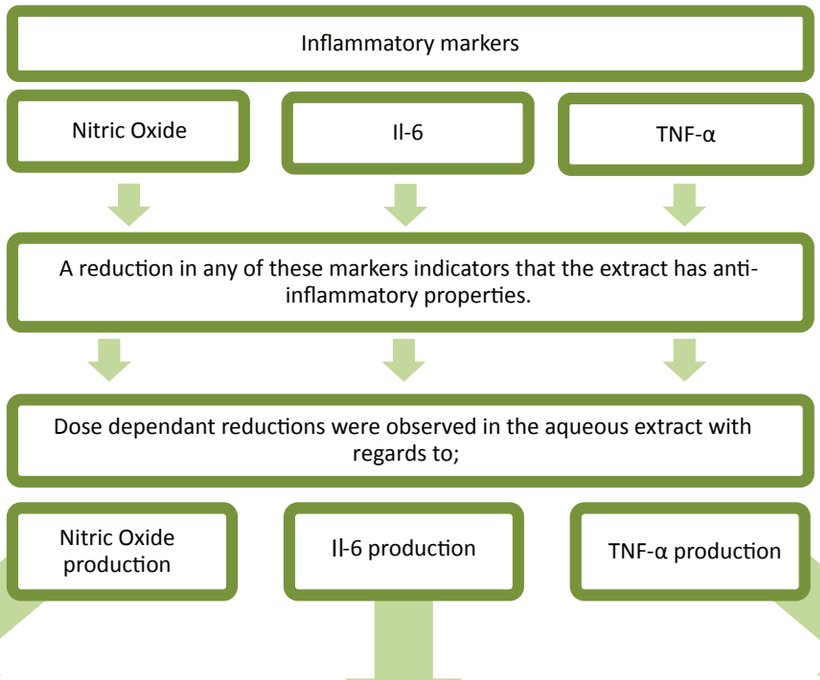
In traditional Māori medicine (rongoā) Kawakawa *(Macropiper excelsum)* is used to treat a wide variety of ailments. It is considered to be one of the most potent medicinal herbs in rongoā[1]. Rongoā is a holistic medicine system which includes both physical (massage), and spiritual (karakia (prayer/incantations))[3] healing techniques. An important part of rongoā is the use of plants[3].

There has been very little previous research into Kawakawa. Previous screening studies have indicated that Kawakawa had little anti-bacterial and anti-viral activity[1,2]. Evidence suggests that the extraction methodologies used in these previous studies were not the most suitable, as both used organic solvents[1,2] whereas traditional Māori preparation used water[3]. This could account for the disparity between what was observed in rongoā and the previous scientific studies. There has been no previous research into Kawakawa's anti-inflammatory properties.

This study sought to investigate the disparity between the evidence in rongoā and the scientific evidence available. It was hypothesised that Kawakawa will have anti-inflammatory activity, providing scientific support for the its use in rongoā.

Results

A positive result is a reduction in the value compared to the control. A reduction in nitric oxide, TNF-α and Il-6 production would be indicative of anti-inflammatory activity. This was observed in the aqueous extract. * Indicates statistical relevance ($P < 0.05$). Statistical significance calculated using a T-test. 0 µg/mL of Kawakawa extract was the control in all samples. Error bars show the standard error of the mean.



Conclusions

Kawakawa has anti-inflammatory activity:

- **Anti-inflammatory activity (a dose-dependent decrease in nitric oxide, TNF-α and Il-6 production) was only observed in the aqueous extract.**
- **Nitric oxide production (figure 1) was supressed at concentrations of 1000 µg/mL and 500 µg/mL.**
- **Inhibition of Il-6 production (figure 2) was maximal at extract concentrations of 1000 µg/mL and 500 µg/mL.**
- **The inhibition of TNF-α production (figure 3) was maximal at extract concentrations of 250 µg/mL and 125 µg/mL.**

Many of the traditional uses of Kawakawa could be linked directly to inflammation (e.g. toothache, irritation, serious bruises)[3]. The anti-inflammatory actions of Kawakawa could mask the symptoms of ailments not directly associated with inflammation (e.g. viral infections).
There been no previous research into the anti-inflammatory properties of Kawakawa, nor has any other research provided a scientific basis that supports the actions of Kawakawa in rongoā. The uses of Kawakawa in rongoā are supported by the anti-inflammatory activity observed.

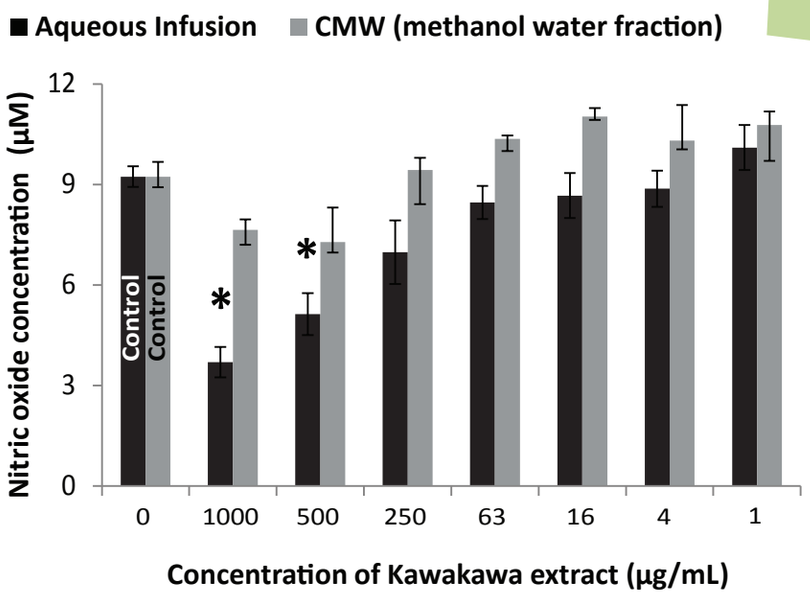


Figure 1: Nitric oxide produced in a variety of Kawakawa extracts: Reductions in the aqueous extract at the concentrations of 1000 µg/mL, and 500 µg/mL.

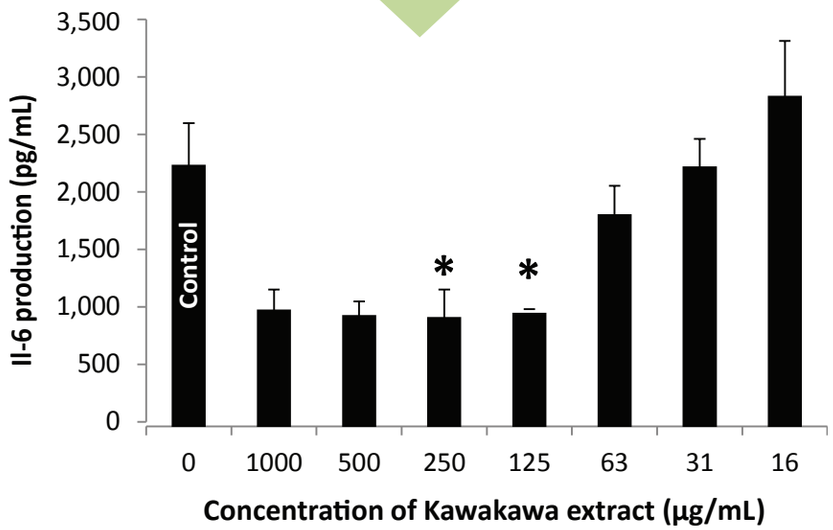


Figure 2: Il-6 production in cells exposed to the aqueous infusion extract: Reductions in the aqueous extract at the concentrations of 250 µg/mL and 125 µg/mL.

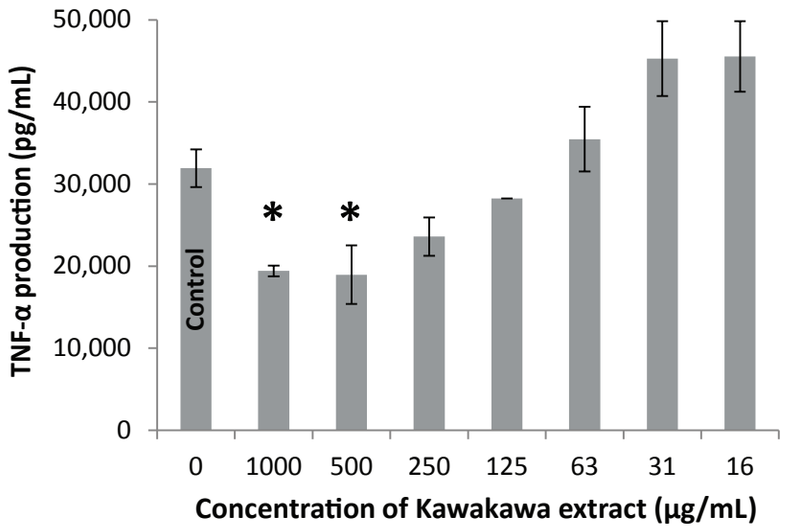
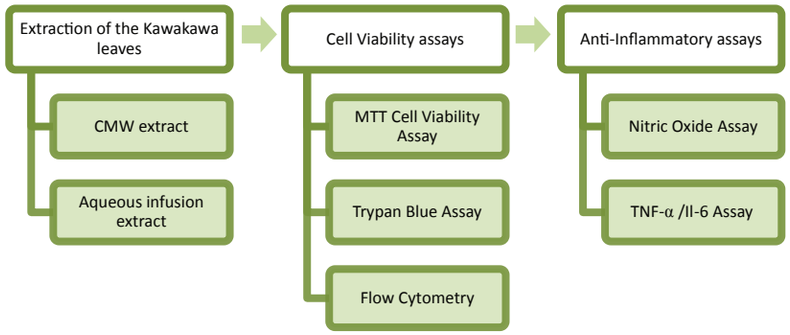


Figure 3: TNF-α production in cells exposed to the aqueous infusion extract: Reductions in the aqueous extract at the concentrations of 1000 µg/mL and 500µ g/mL.

Methodology



Two different methods were used to extract the Kawakawa into a liquid form. The first was an aqueous infusion method (analogous to making a tea) and similar to methods used in rongoā. In the second, leaves were soaked in chloroform-methanol-water (1:2:1 volume to volume). The extract was tested for cytotoxicity in cell viability assays and then the non-toxic concentrations were used in the anti-inflammatory assays.

References & Acknowledgments

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References:

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2. Calder, V. L., Cole, A. L., & Walker, J. R. (1986). Antibiotic compounds from New Zealand plants. III: A survey of some New Zealand plants for antibiotic substances. *Journal of the Royal Society of New Zealand, 16*(2), 169-181.
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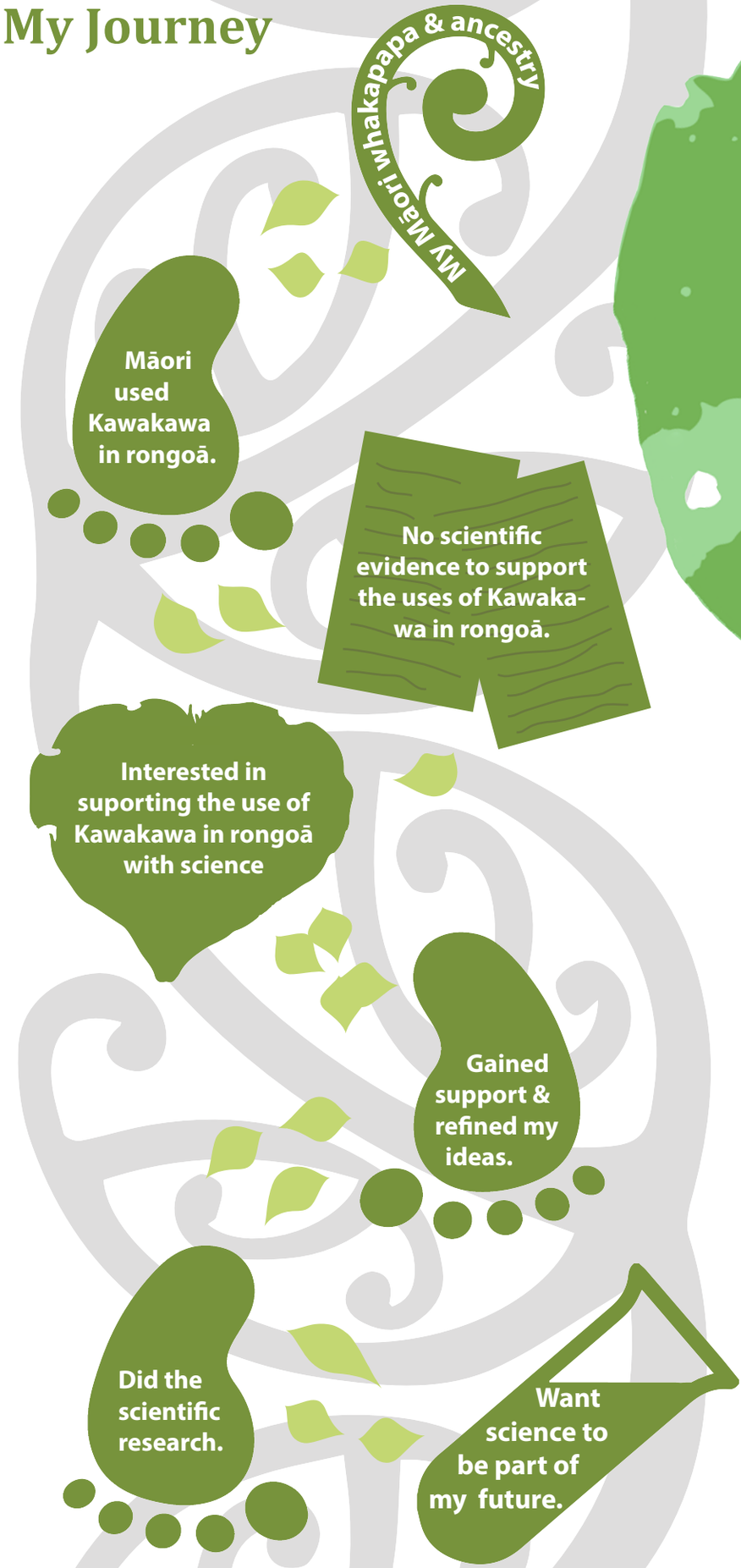

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