

HUATAUKĪNA TŌ IWI E: DEVELOPING MARINE BIOACTIVES ECONOMIC OPPORTUNITIES FROM TAIRĀWHITI KĪNA TO COMBAT DIABETES, HEART DISEASE AND INFLAMMATION.

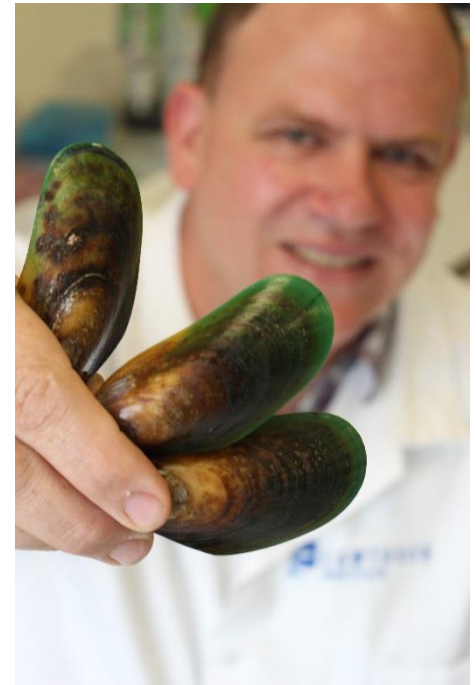
MATT MILLER & SARAH BOND

SEPT 2018



WHO ARE WE?

Cawthron Institute – Dr Matt Miller
NZ oldest and largest independent research institute
Lipid chemist
Chemistry
HVN Musseling up Programme



Massey Uni
Prof Marlena Kruger, Dr Fran Wolber & Dr Sarah Bond
Nutritional Physiologists, Pathologists, Biochemists
Expertise in human nutrition, inflammatory, animal
models, cell models and human clinical intervention
studies

ORIGIN STORY

- Hikurangi Bioactives was working with Cawthron on Freshwater program – Joanna Clapcott
- Manu approached us
- Kina is under-utilised and under-valued
- Knowledge, literature search and conversations with collaborators



- National science challenge
- Sustainable seas
- \$300K
- 2 years
- Contestable fund



Our Seas



Valuable Seas



Tangaroa



Dynamic Seas



Managed Seas



Vision Mātauranga

AIMS OF PROJECT

- This project will produce the essential groundwork knowledge to build a viable kīna marine bioactives industry
 - development of a health-promoting supplements.
 - stimulate economic development in Tairāwhiti
 - partnership between Hikurangi Bioactives Limited Partnership, local hapū and Cawthron Institute.
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- Move from low-value commodity to high-value products
 - Increase diversity and complexity of New Zealand seafood exports
 - Greater economic benefits, particularly for remote rural communities.

National
Science
Challenges

SUSTAINABLE
SEAS

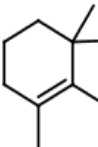
Ko ngā moana
whakauka

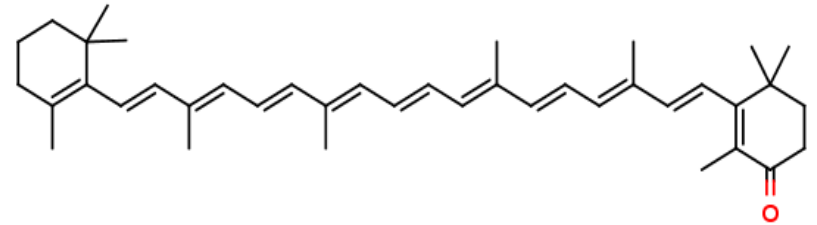
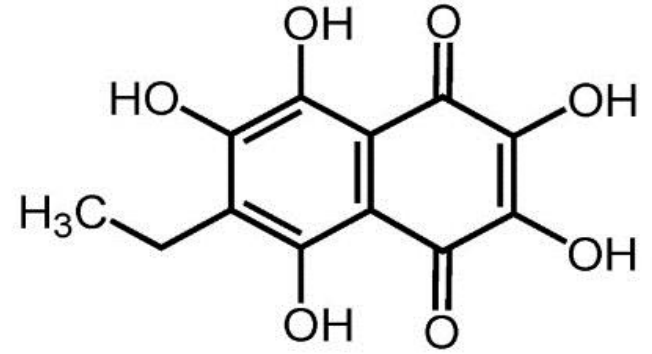
THE PROJECT

- Work with/listen to local iwi
- Chemistry – how to analyse them?
- How much is Kina? Season? Location?
- How to extract at small scale
- What do the extract do?
- Business case



THREE TARGET EXTRACTS

1. Echinochrome A
 - antioxidant, anti-inflammatory and chelating properties
 2. Echinenone
 - antioxidant, antimicrobial, anti-inflammatory
 3. Bioactive fatty acids (aka Kina oil)
 - Omega-3 +
 - potential unique properties compared with its marketplace competitors
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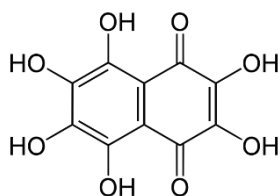
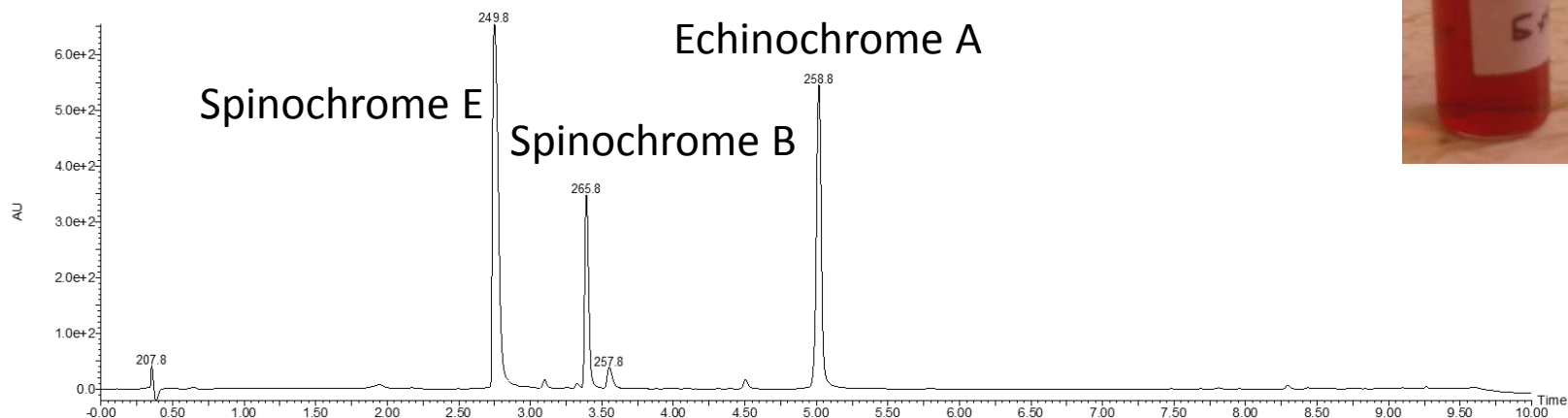


ECHINENONE EXTRACTION

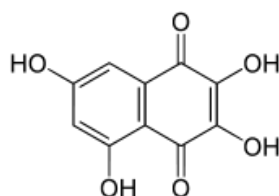


DEVELOPMENT OF METHODS

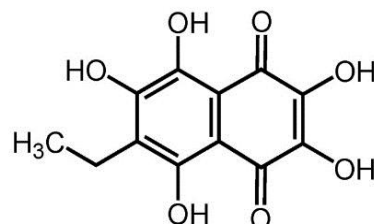
1. Echinochrome A – Echi A



Spinochrome E



Spinochrome B



Echinochrome A

SEASONAL TESTING

- Summer and Autumn sampling done
- Winter is underway
- Final spring sampling in peak time (around Nov)

What do we want to know

- Range of bioactives
- Seasonality
- Location



EFFICACY OF EXTRACTS

- Massey University – Effects of the three extracts in cell models on markers of bone formation and breakdown, markers for joint health, and on gene expression of inflammatory cytokines.
- Victoria Uni – Dr Andrew Munkacsi - gene deletion and proteomic screens, which should give insight on mechanisms and potential uses of Echi A in the nutraceutical and/or pharmaceutical industries. (Echi A only)
- Deakin Uni – Zebrafish model of inflammation (Echi A only)
- Hokkaido University Japan – Prof Masashi Hosokawa, Biochemistry novel models - diabetes and metabolomic syndrome assays

WHERE TO NEXT

- Collate all the data from the seasonal testing
- Communicate this to the iwi and listen
- Understand the different models
- Initial start
- Scaling up extraction
- SCOTT - Standing Committee on Therapeutic Trials
- Further efficacy trials (human clinical?)

National
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Challenges

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SEAS

Ko ngā moana
whakauka

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