Skincare & Therapeutic Benefits of East Cape Mānuka Oil

Manuka BIOSCIENCE™

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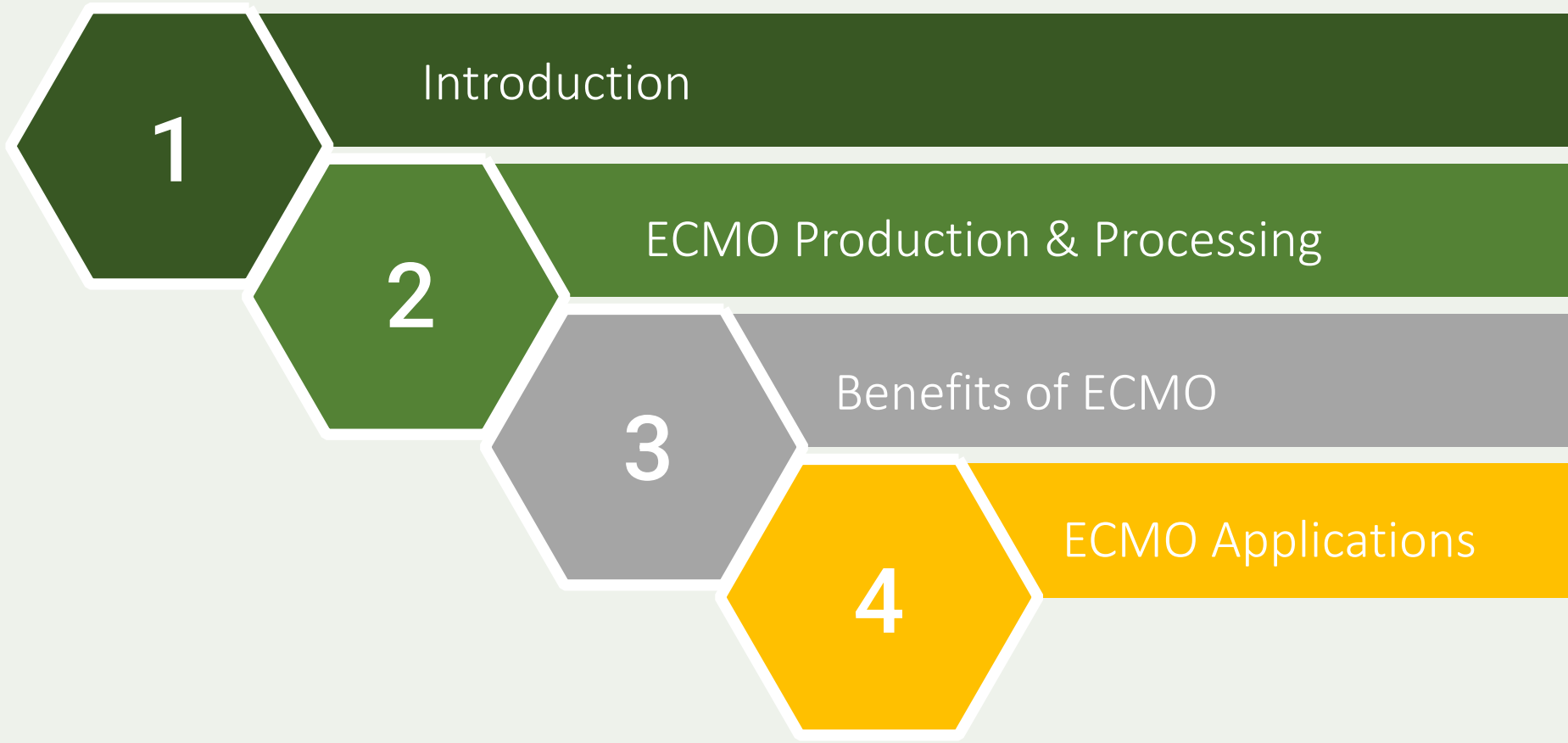
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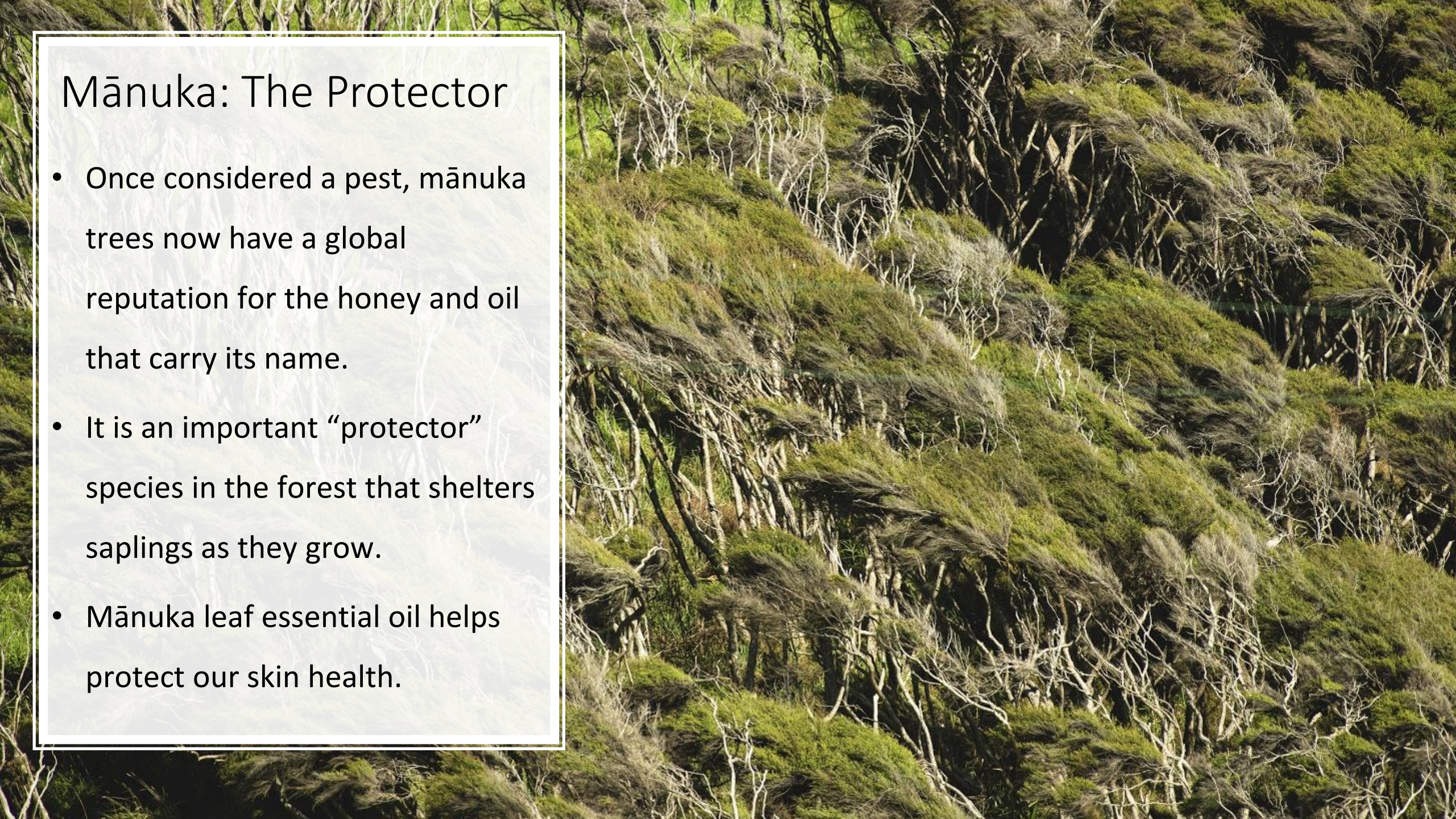
1 Introduction

Manuka Bioscience

- Largest manuka oil producer in the world.
- Sells ManukaRx skincare to 42,000 customers in NZ, Australia and beyond, mostly online and now through Farmers.
- Developing therapeutics for skin infections and inflammatory skin conditions.
- We have an extensive R&D programme, an IP portfolio and two eczema clinical trials under way.

Mānuka: The Protector

- Once considered a pest, mānuka trees now have a global reputation for the honey and oil that carry its name.
- It is an important “protector” species in the forest that shelters saplings as they grow.
- Mānuka leaf essential oil helps protect our skin health.



Traditional Uses

- Māori healers or “tohunga” have understood the medicinal properties of all parts of the mānuka tree for centuries.
- They have used mānuka leaves, branches, flowers and bark to treat colds, acne, pain, inflammation, burns, cuts, wounds, skin and oral infections and more.

Power of Mānuka

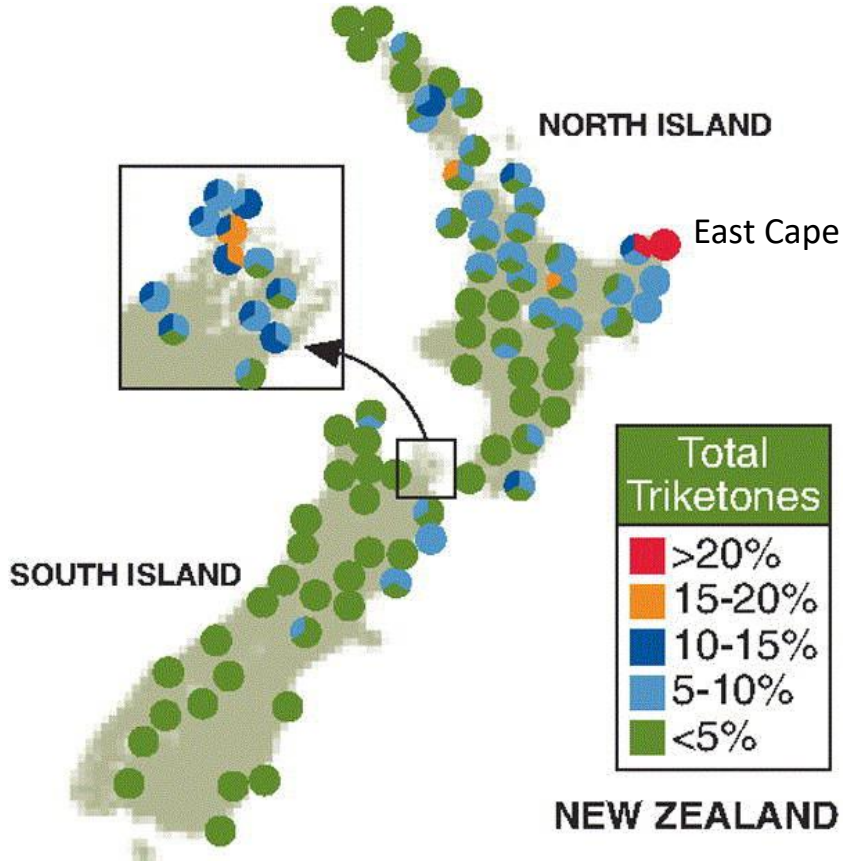
- Isolated and predator-free for 80 million years, NZ has globally unique native flora e.g., mānuka.
- Over time, manuka trees have adapted to NZ's climate, especially the sun's harsh UV rays, by producing protective chemicals.
- These chemicals provide benefits not only to the trees themselves but also to humans and animals.

Mānuka & Its Global Cousins

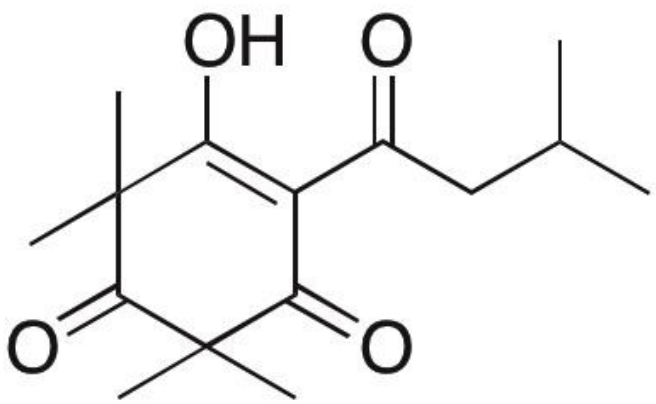
- Mānuka is part of the myrtle family which began 60 million years ago in the Paleocene era.
- It has 3,300 different species that include pōhutukawa, feijoa, tea tree, rose apple, and clove.
- All myrtle species are woody with evergreen leaves that contain tiny sacs filled with essential oils.
- Mānuka grows all over NZ and parts of Australia.

What is Special About East Cape Mānuka Oil (ECMO)?

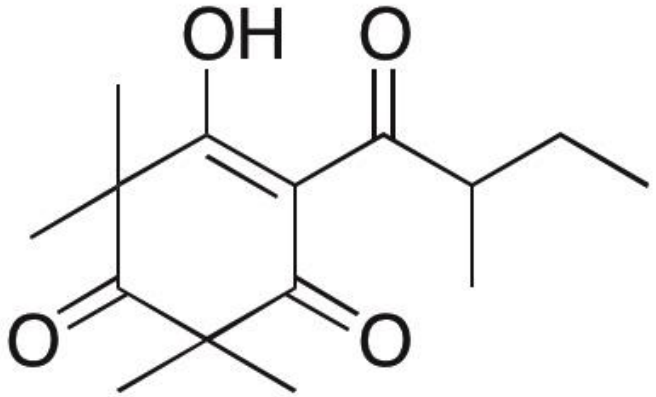
- Mānuka trees found in different locations have a unique chemical identity or “chemotype”.
- Globally Unique, high triketone chemotype mānuka is found only in the East Cape region.
- High triketone ECMO has powerful antibacterial, antifungal, antiviral, anti-inflammatory, antioxidant, antiaging and wound healing properties.
- East Cape manuka has 20%+ triketones. Most NZ mānuka have <5% triketones. Australian manuka has no triketones.



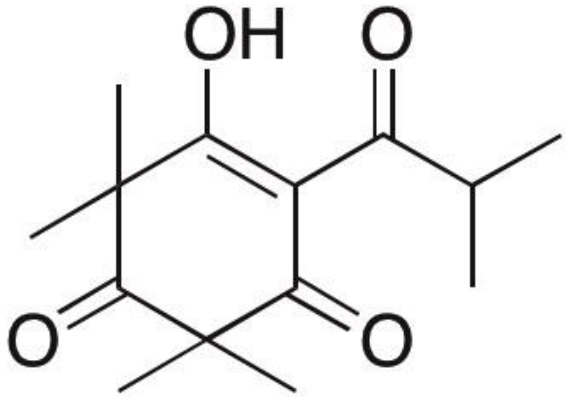
Triketone Levels in NZ Mānuka Oil



Leptospermone
$C_{15}H_{22}O_4$



Isoleptospermone
$C_{15}H_{22}O_4$



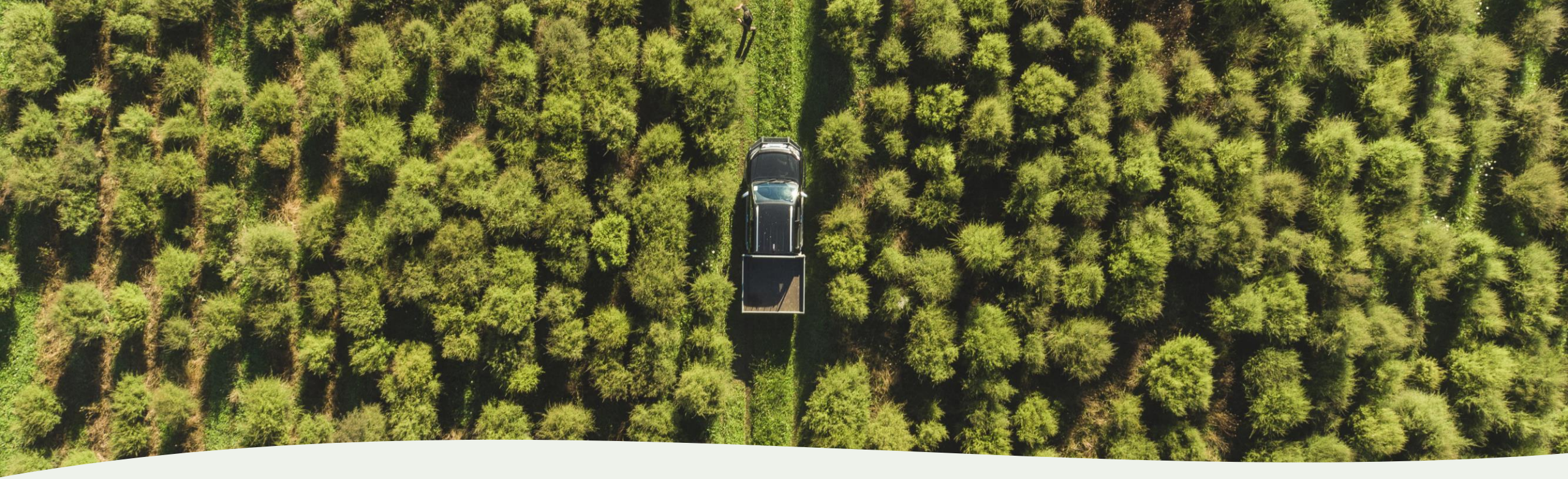
Flavesone
$C_{14}H_{20}O_4$

Therapeutic Triketone Compounds in ECMO

2 ECMO Production & Processing

Harvesting Mānuka Foliage

- Manuka Bioscience runs a genetic program for finding the most yielding triketones and producing the seeds for annual replanting
- Until recently, almost all mānuka oil production came from leaves and twigs harvested from wild crops.
- Harvesters used brush cutters to gather foliage, leaving the trees to regrow for harvesting every 6-12 months.
- One tonne of foliage produces just 2 to 5 liters of precious mānuka essential oil.



Mānuka Plantations

- Over the last decade, East Cape has become home to sustainably managed mānuka plantations.
- Mechanical harvesters are now used to gather mānuka foliage to produce essential oil at a commercial scale for global customers.

ECMO Production Process

- ECMO is extracted using a steam distillation process that uses no chemicals or solvents.
- Steam is passed through the mānuka leaf material for five hours.
- Steam is then condensed, and ECMO is separated from condensed water.
- ECMO is tested and batched according to triketone content.

Community Support & Sustainability

Long term, sustainable, value-sharing partnerships in the East Cape underpin the ECMO industry.

Jobs for local people and income streams for Māori landowners.

Over 5 million mānuka trees planted to date. No trees are cut down in the process of making ECMO.

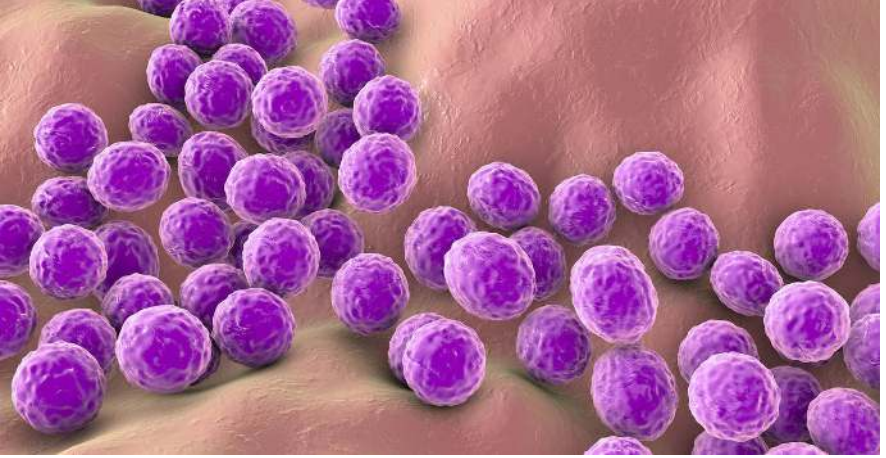
Mānuka trees help take care of biodiversity, enhance soil stability and improve stream water quality.

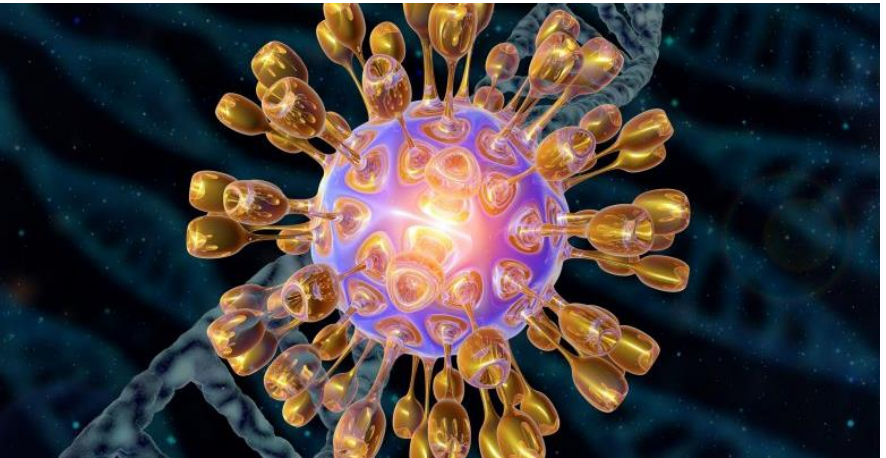
Our Mānuka Oil is certified organic by Nature/Biogro and Cosmos natural.

3 Benefits of ECMO

Mānuka Oil Research

- Over the last 50 years, global research teams have investigated the powerful antibacterial, antiviral, antifungal, anti-inflammatory, antioxidant, antiaging and wound healing properties of mānuka oil.
- It is now the most researched NZ botanical ingredient with over 1,000 peer reviewed scientific publications.





ECMO Antimicrobial Properties

- Natural triketone compounds in ECMO are responsible for the oil's outstanding anti-bacterial, antifungal and antiviral properties.
- ECMO is 30 times more powerful than tea tree oil and 1,000 times more powerful than mānuka honey against bacteria e.g., staph and strep that cause common skin infections such as impetigo, sores, boils and abscesses.

ECMO Minimum Bactericidal Concentrations (MBC)

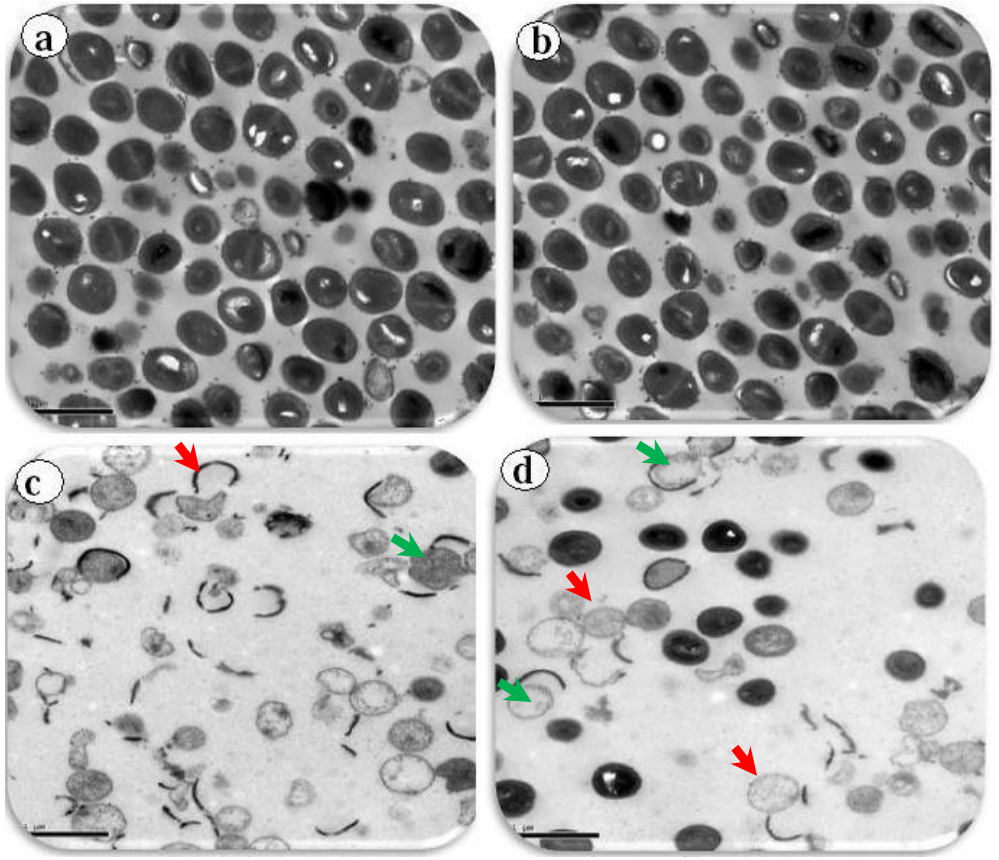
- MBC is the lowest concentration of an antibacterial agent required to kill a bacterium.

Bacteria	Skin Conditions	MBC
Staphylococcus aureus (Staph)	• Skin and wound infections including impetigo (school sores), boils, abscesses, cellulitis, folliculitis, carbuncles • Worsens inflammatory skin conditions e.g., eczema	0.091%
Streptococcus pyogenes (Strep)	• Skin infections such as impetigo, erysipelas, cellulitis, flesh eating bacterial disease	0.094%
Cutibacterium acnes	• Acne, blepharitis	0.102%
Staphylococcus hominis	• Body odour	0.200%

Killing MRSA Superbug

- MRSA “superbug” is an antibiotic-resistant staph bacteria that causes serious skin and wound infections.
- ECMO is highly effective against MRSA.
- UK study compared untreated MRSA bacteria vs bacteria treated with 1.5% ECMO for 4 hours.
- Demonstrates bacterial cell breakdown and leakage of cellular contents in the presence of ECMO.

Electron Microscopy (EM) Images of MRSA Bacteria Treated With ECMO



(a) & (b) are untreated bacteria controls. (c) & (d) are MRSA bacteria treated with 1.5% mānuka oil. Cell lysis shown in green and released cell contents and cell debris shown in red.

Effectiveness of ECMO Against Oral Pathogens

- ECMO is highly effective against bacteria that cause tooth and gum disease.
- Japanese study showed mānuka was the most effective out of mānuka, tea tree, eucalyptus, lavender and rosemary oils in killing oral pathogens *P. gingivalis, F. nucleatum, A. actinomycetemcomitans, St.mutans* and *S. sobrinus.*
- These bacteria were killed when exposed to 0.2% mānuka oil for 30 seconds.

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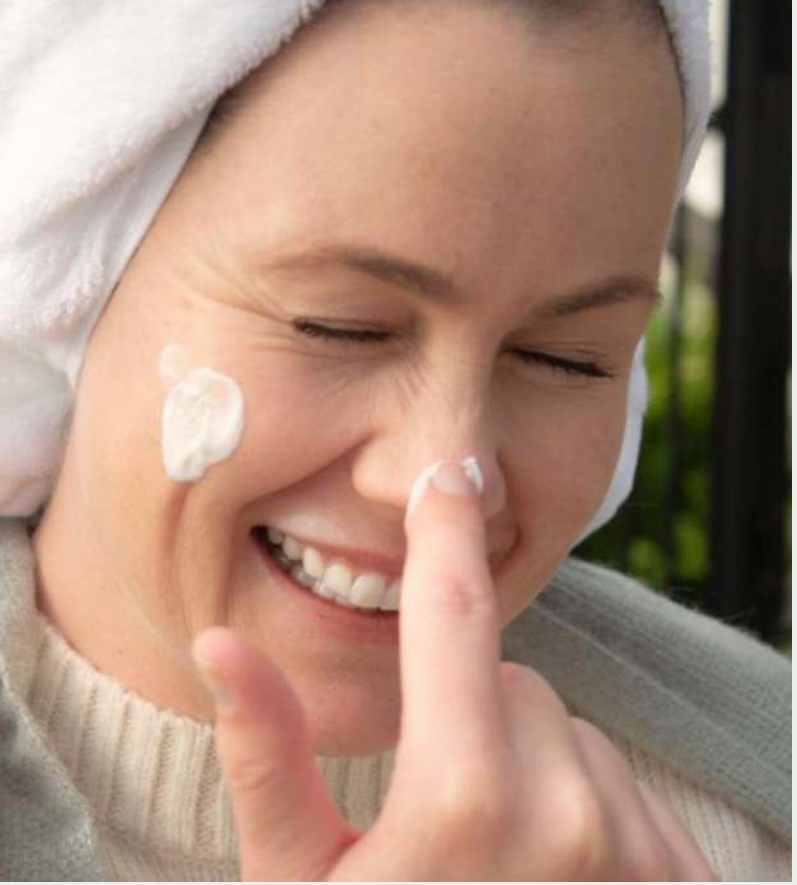
ECMO Applications



Some ECMO Uses

- Acne treatment.
- Dermatology.
- Personal care, oral care, sanitization.
- Aromatherapy.

Infection Control

- ECMO is strongly effective against *staph* and *strep* bacteria that cause many common skin and wound infections.
- Effective against antibiotic resistant “superbug” MRSA that causes serious skin and wound infections.
- Treats viral infections e.g., herpes, flu, Covid-19.
- Ideal as a skin, hand and surface sanitiser in a range of applications, including aesthetic medicine.

Acne Treatment

- Acne is an inflammatory skin condition that affects 85% of teenagers and 14% of adults.
- ECMO is 12 times more effective than tea tree oil in killing acne bacteria *Cutibacterium acnes.*
- ECMO also calms the skin, promotes healing and prevents scarring.

Personal Care

- ECMO is used as a natural antibacterial ingredient in personal care products such as lip balm, soap, deodorant, face and handwash, shower gel etc.,
- Used in antibacterial gels used to treat everyday skin problems such as cuts, scratches, broken cuticles, insect bites, chapped lips, minor burns, dry skin, sunburn etc.,

ECMO for Maskne

- Over 50% of people who wear face masks for long periods get “maskne”, characterised by acne, facial eczema and itchy skin.
- Maskne occurs when moist and warm air accumulates within mask, leading to an imbalance in the skin microflora.
- ECMO is an ideal maskne treatment since it kills bacteria and fungi that exacerbate maskne, reduces skin inflammation, helps heal wounds and calms the skin.

ECMO in Covid-19 Care

Hand Sanitiser Formulation

Phase	Operating instructions	Material Name	EU INCI	% Material
A	Add water to a clean beaker. Add ingredients in order. Mixing well after each addition.	Water	Aqua	76.000000
		Glycerin	Glycerin	5.000000
		Propanediol	Propanediol	2.000000
		BETAINE	Betaine	2.000000
B	In a separate container mix Manuka oil and SLES until clear before adding it to the batch.	SLES 27%	Aqua Sodium Laureth Sulfate	11.100000
		Manuka Oil	Leptospermum Scoparium Branch/Leaf Oil	1.000000
C	Add the lactic acid and mix well. Adjust the pH to 4.0 with Sodium Hydroxide Solution if needed.	Lactic Acid 80%	Lactic Acid Aqua	2.900000
				100.00000

- C-19 sufferers have a high viral load in their oral/nasal cavities. ECMO kills C-19 virus and is ideal in dental/oral/nasal rinses.
- Adding a few drops of ECMO to steam inhalation vessels can increase efficacy of this important home treatment.
- ECMO is a broad-spectrum antimicrobial ingredient for use in skin and surface sanitisers.

Thank You!

www.manukabioscience.co.nz
www.manukarx.co.nz

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