

2023



MYRTLE RUST

SPECIAL EDITION

COMMISSIONED BY TOI TAI AO WHAKATAIRANGA

E ngā mana,
E ngā reo,
E rau rangatira mā,
Tēnā koutou,
tēnā koutou,
tēnā koutou!

Ngā mihi maioha ki: Toi Taiao Whakatairanga; The Kauri Project;
Otago University/Ōtākou Whakaihu Waka Department of Botany;
Plant & Food Research/Rangahau Ahumāra Kai; Mobilising For Action,
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Mark Harvey, Sophie Jerram, Ariane Craig-Smith, Chris McBride,
Nick Waipara, Molly Mullen, Robert Beresford

- Ngā mihi nui mō ōu awhi me tautoko, me mātauraka
TTW whānau me artists, thank you to everyone who
has been a part of this project.

Mauri Ora!

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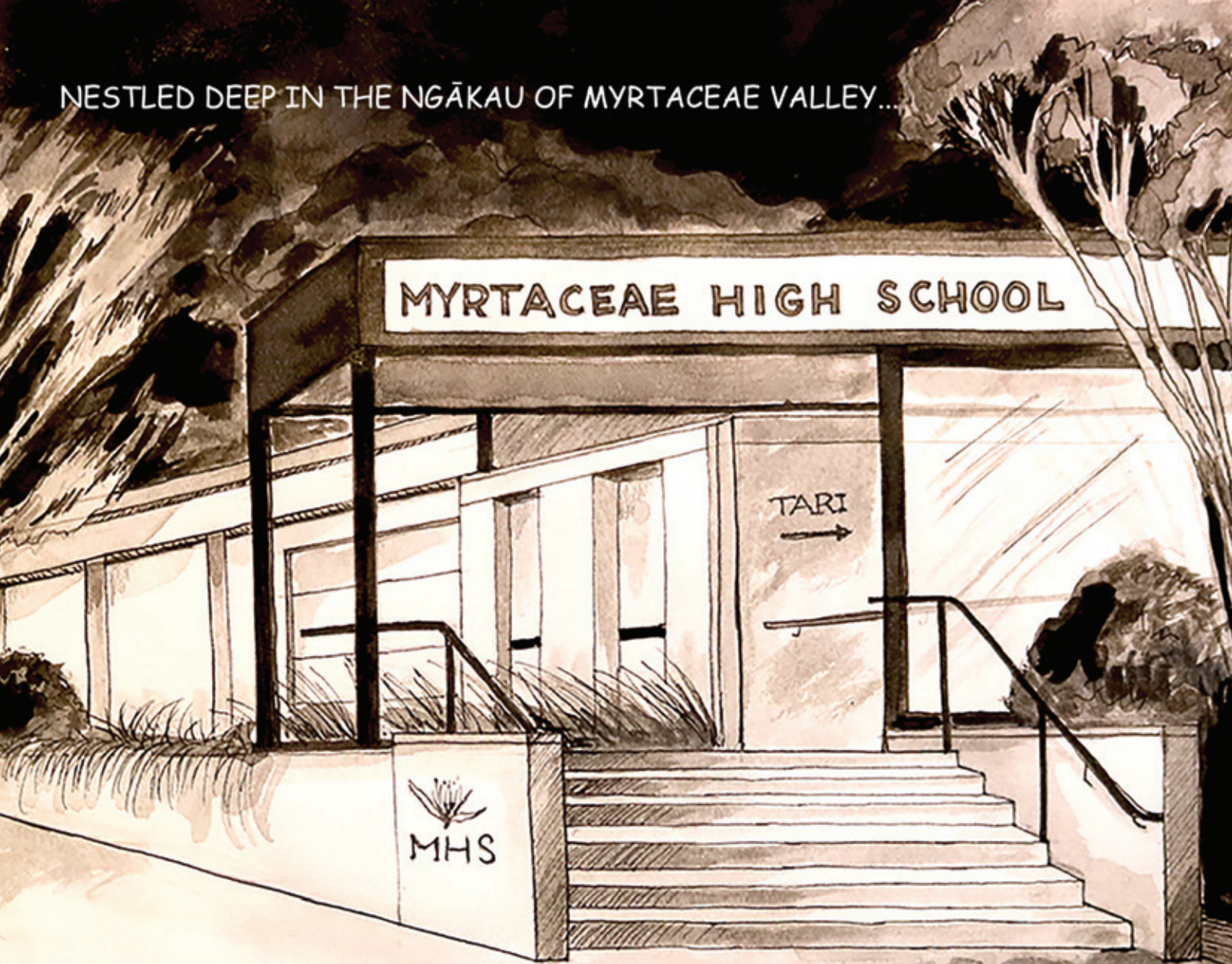
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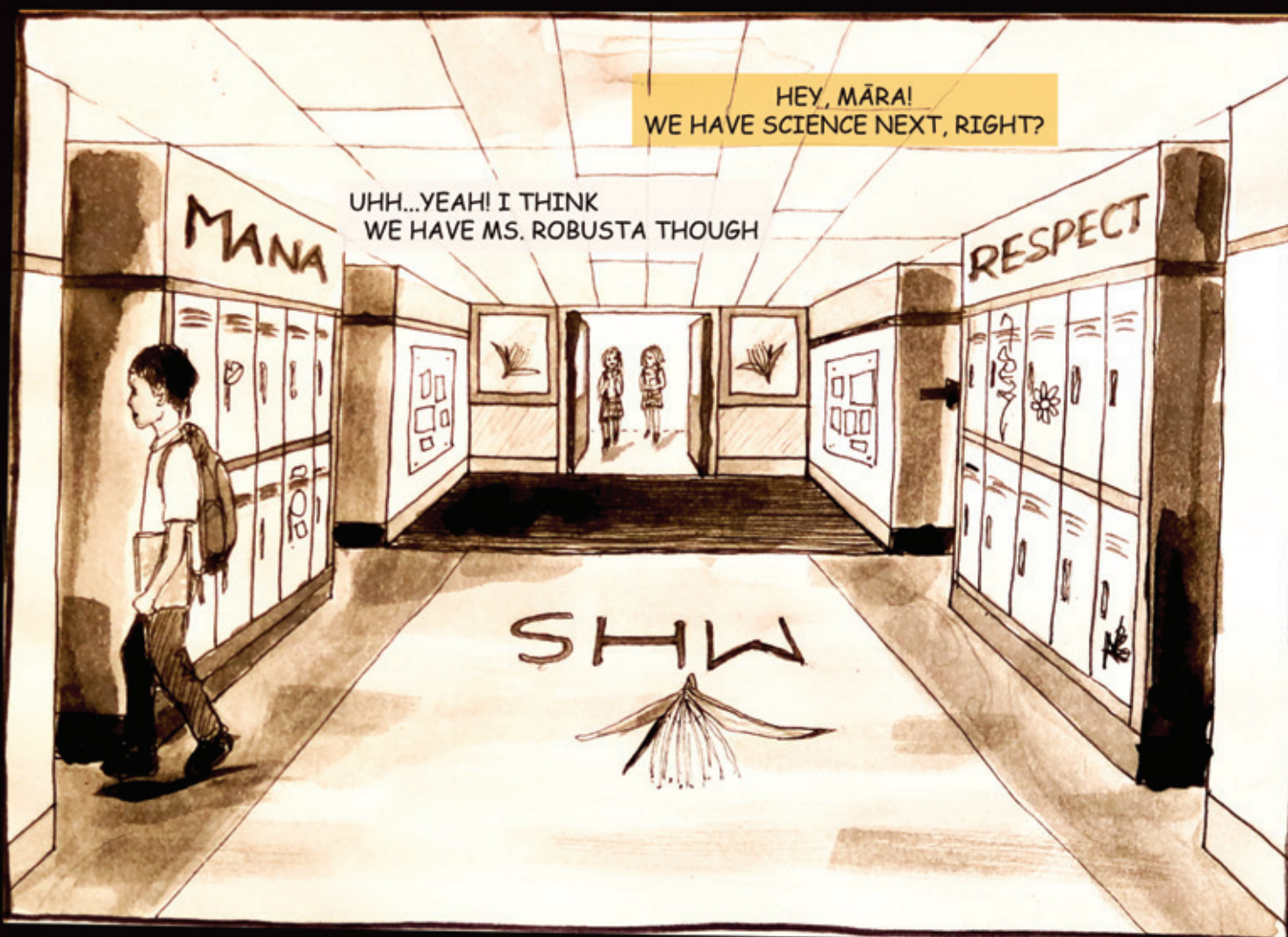
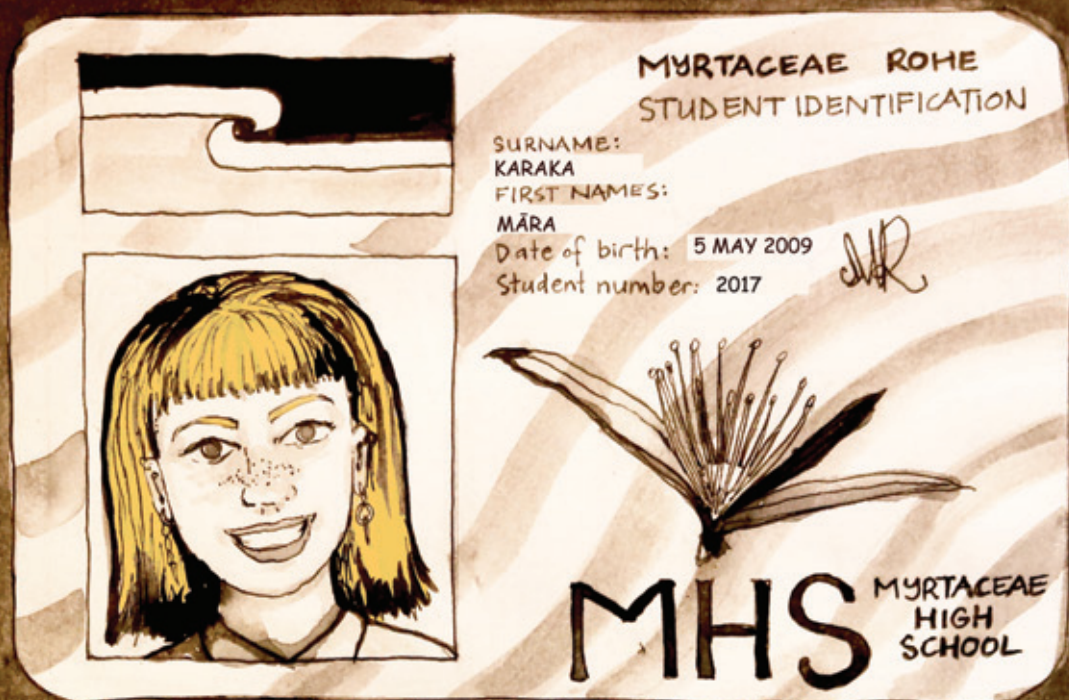
This resource was funded by Mobilising for Action,
a research theme within Ngā Rākau Taketake

NESTLED DEEP IN THE NGĀKAU OF MYRTACEAE VALLEY...



...SITS MYRTACEAE HIGH SCHOOL -
WELL KNOWN FOR PRODUCING SOME OF
AOTEAROA'S MOST BRILLIANT
SCIENTISTS AND ARTISTS...

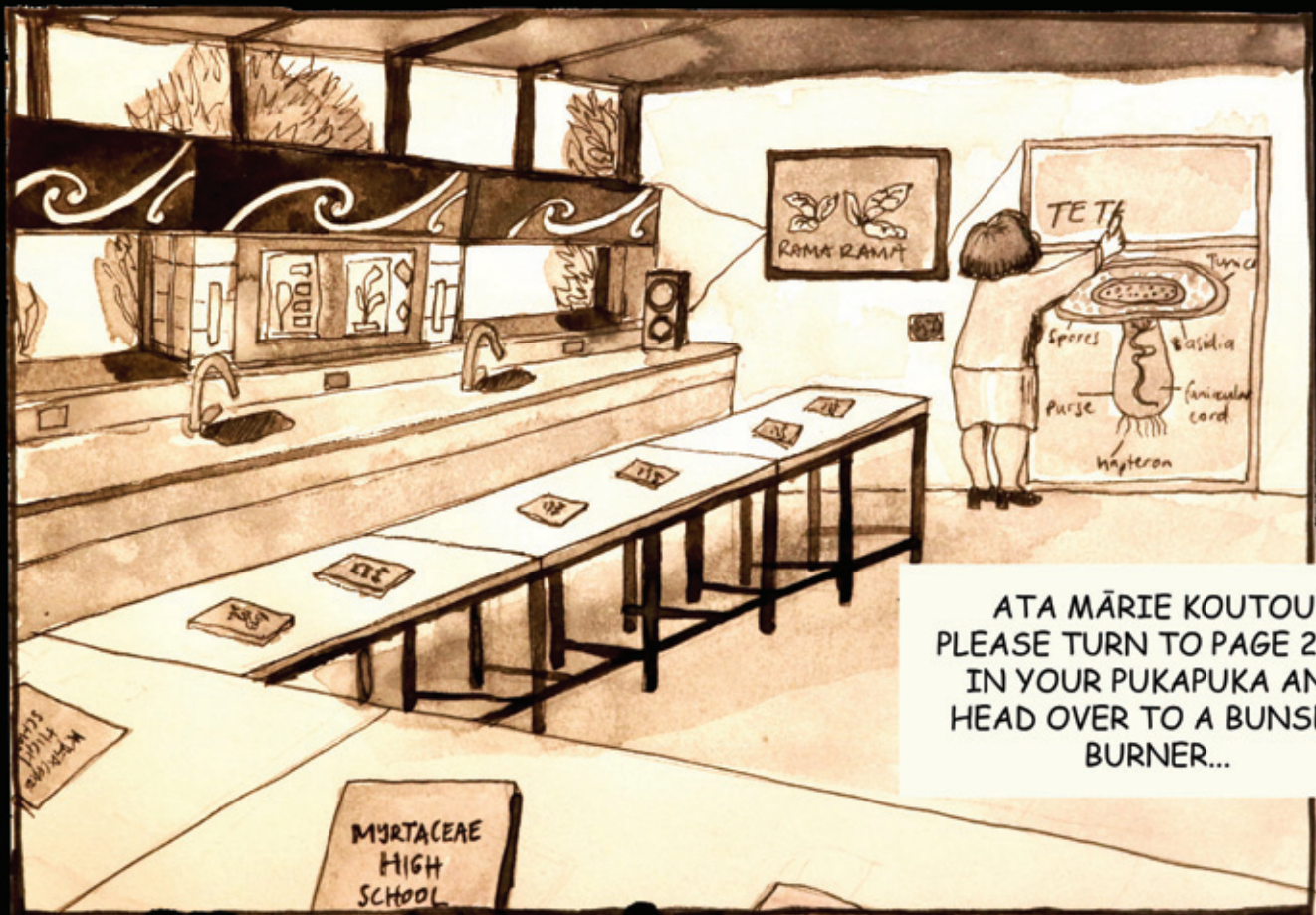
...AND WHERE A NEW GENERATION OF
CRAFTY AND CREATIVE MINDS
GO TO IMPROVE THEIR TALENTS



PŪTAIA O

UGGH STINK!
SHE'S GONNA
MAKE ME SIT ON
MY OWN AGAIN -
I DIDN'T EVEN
TALK LAST TIME

DON'T WORRY,
SHE LOVES ME SO
I'LL DISTRACT HER!



ATA MĀRIE KOUTOU!
PLEASE TURN TO PAGE 2017
IN YOUR PUKAPUKA AND
HEAD OVER TO A BUNSEN
BURNER...

ONCE YOUR BUNSEN BURNER
IS GOING, MEASURE YOUR
POTASSIUM BICARBONATE
AND HEAT IT SLOWLY....





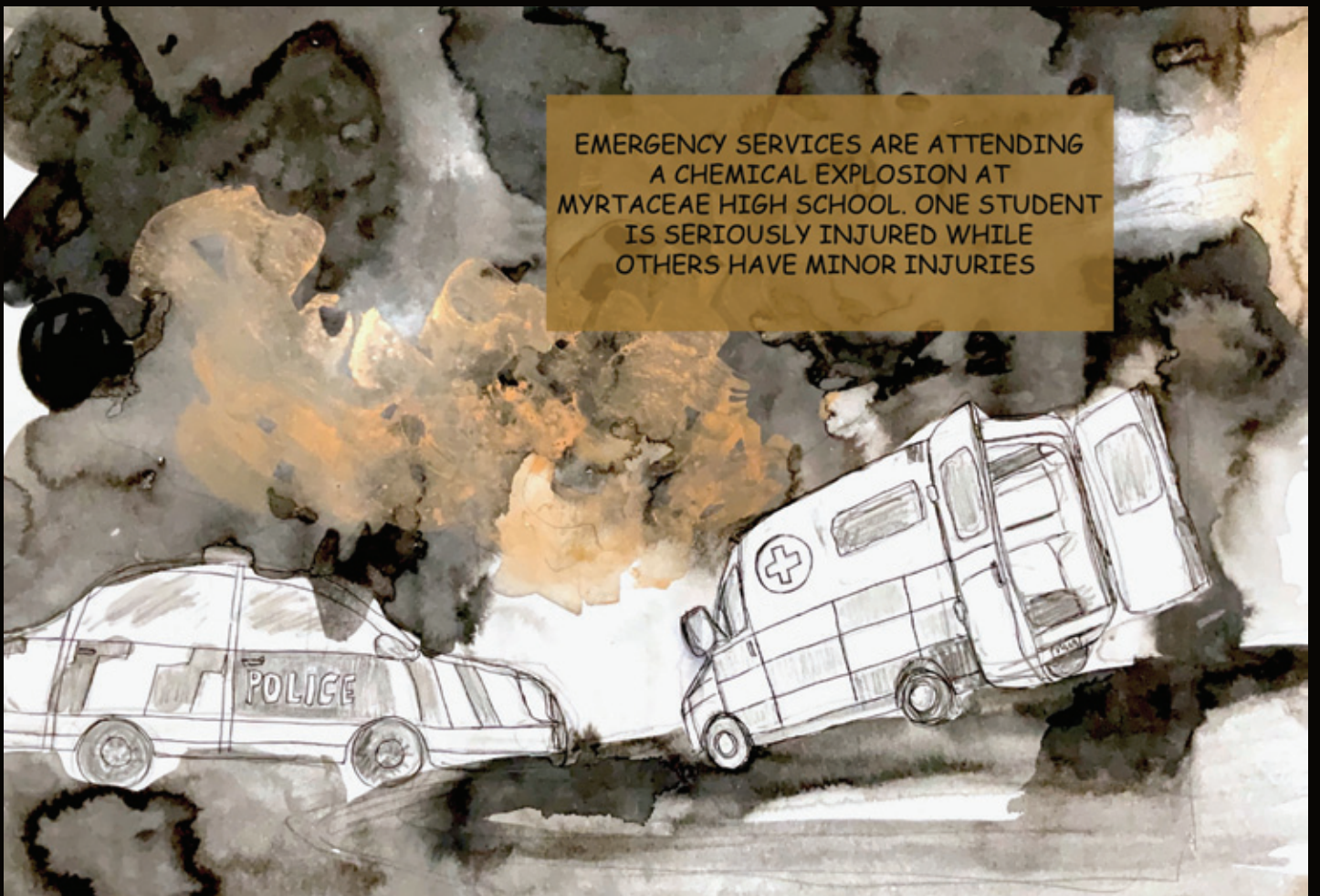
BOOM!

BREAKING NEWS

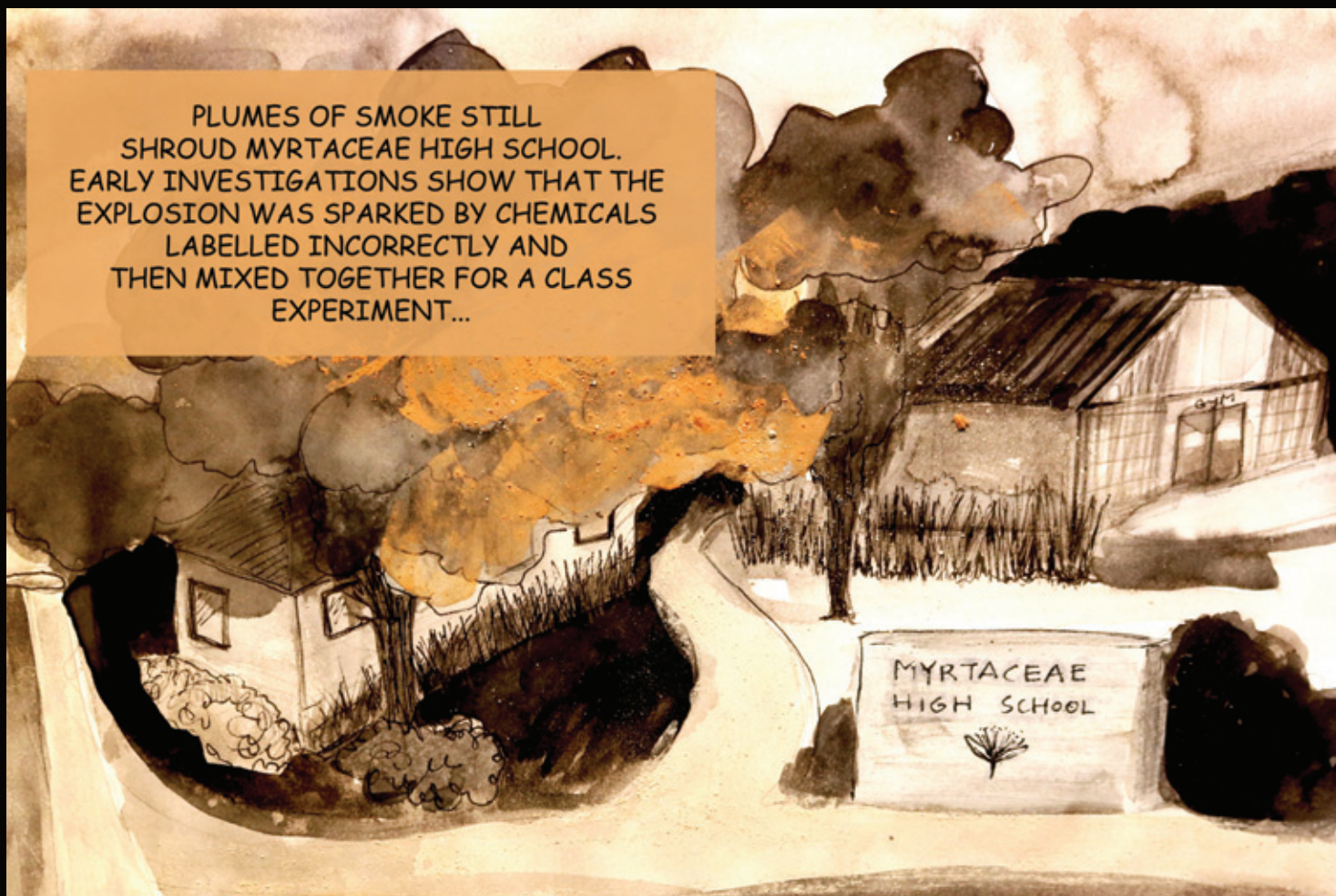
PŌ MĀRIE KOUTOU.
IN BREAKING NEWS
THERE HAS BEEN AN
EXPLOSION AT MYRTACEAE
HIGH SCHOOL



EMERGENCY SERVICES ARE ATTENDING
A CHEMICAL EXPLOSION AT
MYRTACEAE HIGH SCHOOL. ONE STUDENT
IS SERIOUSLY INJURED WHILE
OTHERS HAVE MINOR INJURIES

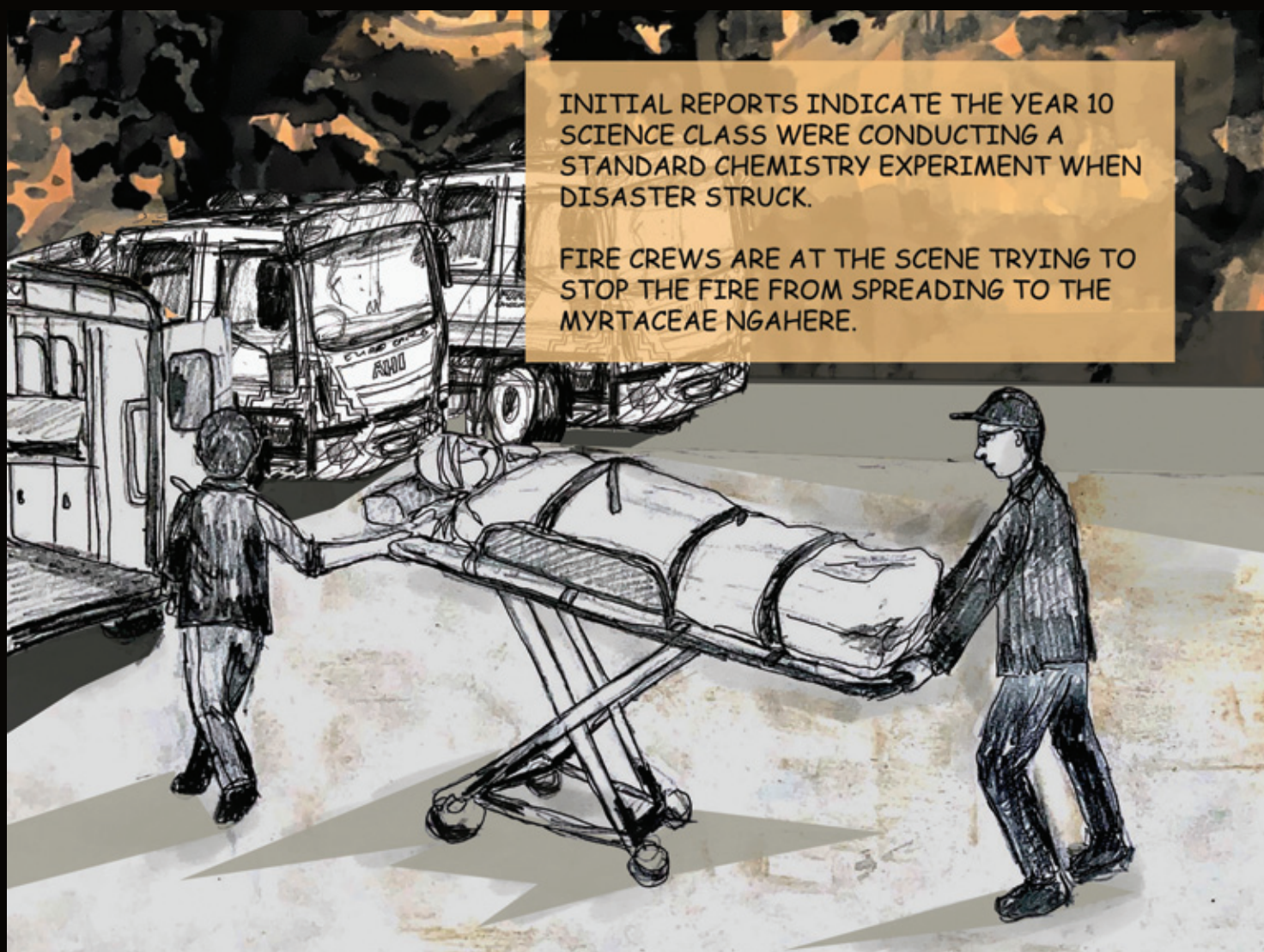


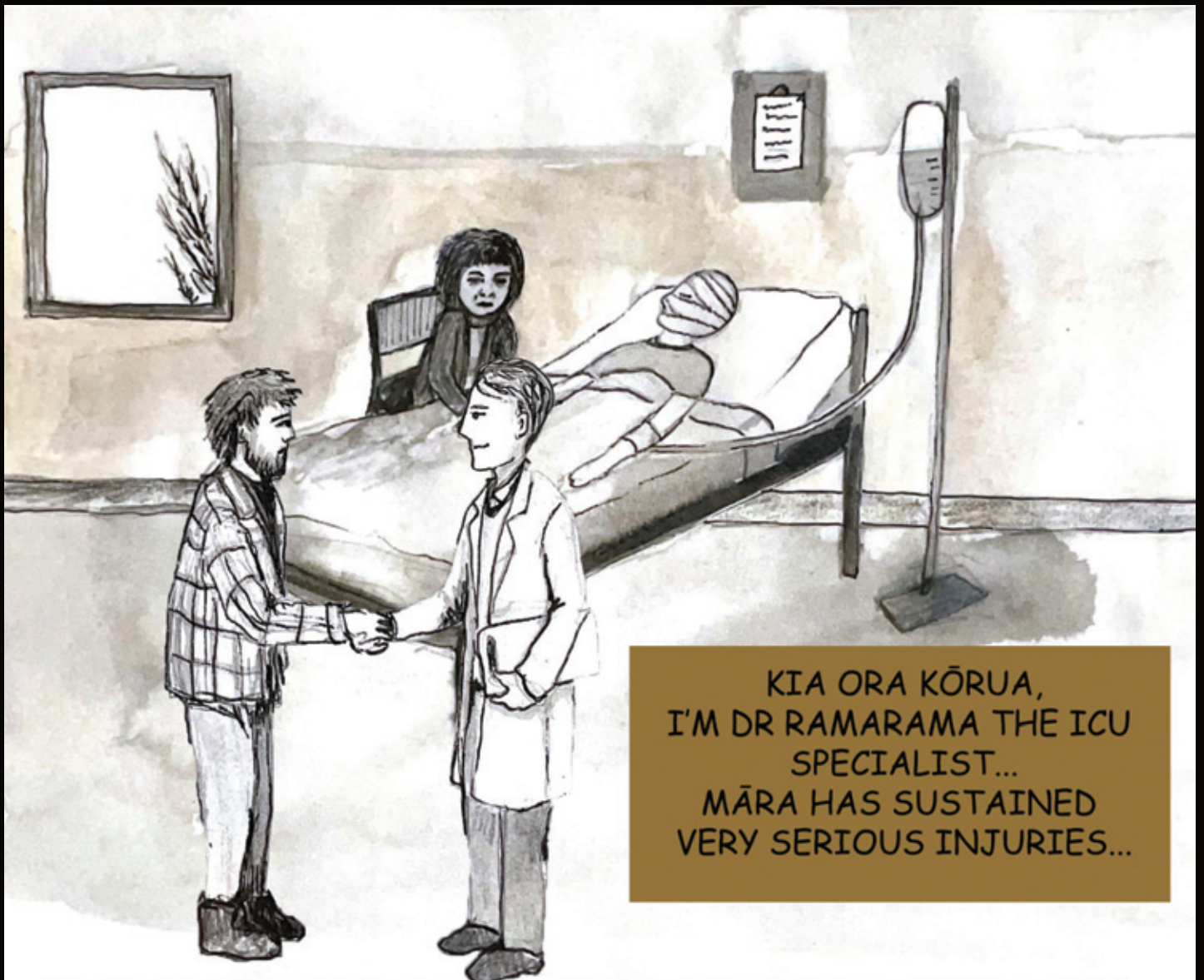
PLUMES OF SMOKE STILL
SHROUD MYRTACEAE HIGH SCHOOL.
EARLY INVESTIGATIONS SHOW THAT THE
EXPLOSION WAS SPARKED BY CHEMICALS
LABELLED INCORRECTLY AND
THEN MIXED TOGETHER FOR A CLASS
EXPERIMENT...



INITIAL REPORTS INDICATE THE YEAR 10
SCIENCE CLASS WERE CONDUCTING A
STANDARD CHEMISTRY EXPERIMENT WHEN
DISASTER STRUCK.

FIRE CREWS ARE AT THE SCENE TRYING TO
STOP THE FIRE FROM SPREADING TO THE
MYRTACEAE NGAHERE.





KIA ORA KŌRUA,
I'M DR RAMARAMA THE ICU
SPECIALIST...
MĀRA HAS SUSTAINED
VERY SERIOUS INJURIES...

THEY ARE IN A COMA AND WILL NEED TO BE ATTACHED TO AN OXYGEN MACHINE TODAY. THEIR PHYSICAL INJURIES WILL TAKE APPROXIMATELY A YEAR TO HEAL, BUT WE DO NOT KNOW WHEN THEY WILL REGAIN CONSCIOUSNESS...

THERE IS A SCIENTIFIC CORPORATION THAT IS RESEARCHING AN EXPERIMENTAL FUNGUS SHOWING PROMISING SIGNS OF REVIVING PATIENTS
- WOULD YOU LIKE TO MEET WITH THEM?

AGRI-TECH NEWS DAILY

23 MARCH 2023

TECH GIANT SYZYGIUM CORP ANNOUNCE NEW BOARD OF DIRECTORS

CEO, Telio Spores of Syzygium Corporation has announced a complete new Board of Directors for 2023. The incoming members are investing in the use of plant pathogen science, incorporating fungal parasites into medical procedures. The outgoing Board members are taking Syzygium Corporation to the Scientific Ethics Committee for a review of what has been labelled a 'white washing of social and ethical issues' related to current practices. Controversial scientific practices include the reviving of comatose patients using the unpredictable plant pathogen, *Austropuccinia psidii* - commonly known as Myrtle Rust.



New board of directors L - R:
Ure Dinia, B.A. Sidio, and G. Nome

SYZYGIUM CORPORATION

GLOBAL
PARASITE



CORPORATE NEWS:

THE SYZYGIUM CORPORATION IS HAPPY TO ANNOUNCE THE APPOINTMENT OF LEAD SCIENTIST, DOCTOR APRIL APPRESSORIA.

DR APPRESSORIA HAS 20 YEARS OF EXPERIENCE WORKING WITH AIRBORNE PLANT PATHOGENS AND HAILS FROM SOUTH AMERICA. SHE WILL BE LEADING THE EXCITING RUST FUNGUS RESEARCH AND DEVELOPMENT PROJECT.



DOCTOR APRIL APPRESSORIA



LEAD SCIENTIST, DR APPRESSORIA HAS FOUND ACCELERATED GROWTH HORMONES IN *AUSTROPUCCINIA PSIDII*. WE BELIEVE THIS CAN REVIVE MĀRA FROM THEIR COMA BUT WILL REQUIRE THEM TO BE MONITORED WEEKLY.



THESE SPORES FORM BRIGHT YELLOW, POWDERY PUSTULES ON THE PLANT WHICH GERMINATE ON THE LEAF SURFACE.

THE FUNGUS WILL GROW INSIDE THE PLANT, STEALING NUTRIENTS AND ENERGY FROM ITS HOST.

RISK OF INFECTION IS MORE LIKELY WHEN THERE IS NEW GROWTH, WATER ON THE PLANT SURFACE FOR MORE THAN 6 HOURS AND HUMID TEMPERATURES BETWEEN 15° - 25° DEGREES



PŌHUTAKAWA



RĀMA RĀMA



KĀNUKA

AUSTROPUCCINIA PSIDII, THE MYRTLE RUST FUNGUS, SPREADS THROUGH MICROSCOPIC AIRBORNE SPORES THAT ATTACH THEMSELVES TO VULNERABLE HOST PLANTS FROM THE MYRTACEAE FAMILY.



SOUTHERN RĀTĀ

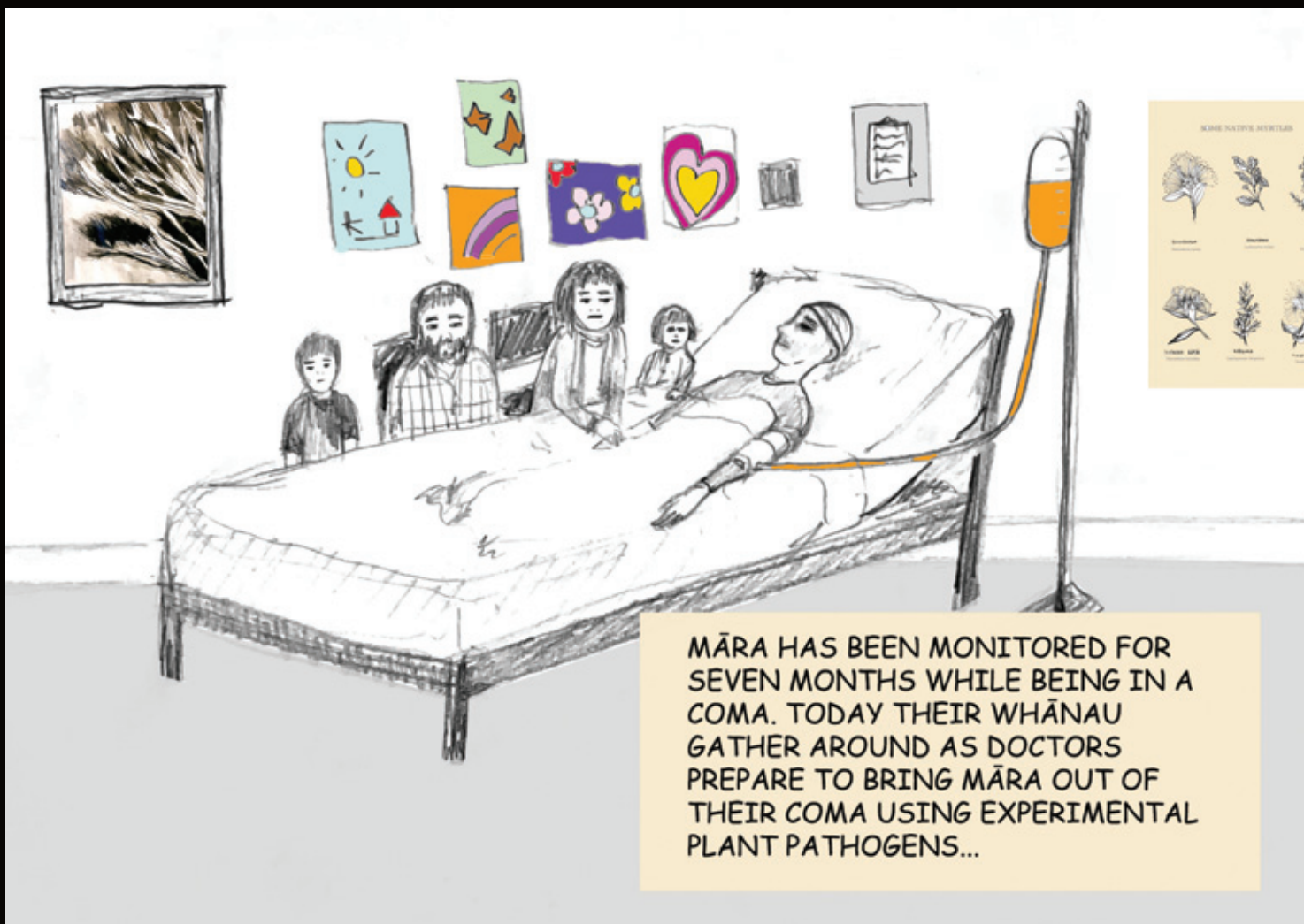


MĀNUKA



MAIRE TAWAKE

SOME NATIVE MYRTLES ARE: PŌHUTAKAWA, RAMARAMA, KĀNUKA, SOUTHERN RĀTĀ, MĀNUKA AND MAIRE TAWAKE.



KIA ORA ĀNO WHĀNAU.
KEI TE PAI KOUTOU?
KO DOCTOR APPRESSORIA
TĒNEI. SHE HAS THE
SERUM PREPARED FOR
MĀRA...



HELLO THERE,
I'M DOCTOR APPRESSORIA,
FROM SYZYGIIUM CORP,
PLEASED TO MEET YOU!
LIKE DR RAMARAMA SAID,
I HAVE THE SERUM HERE
AND READY TO GO...
SHALL WE PROCEED?



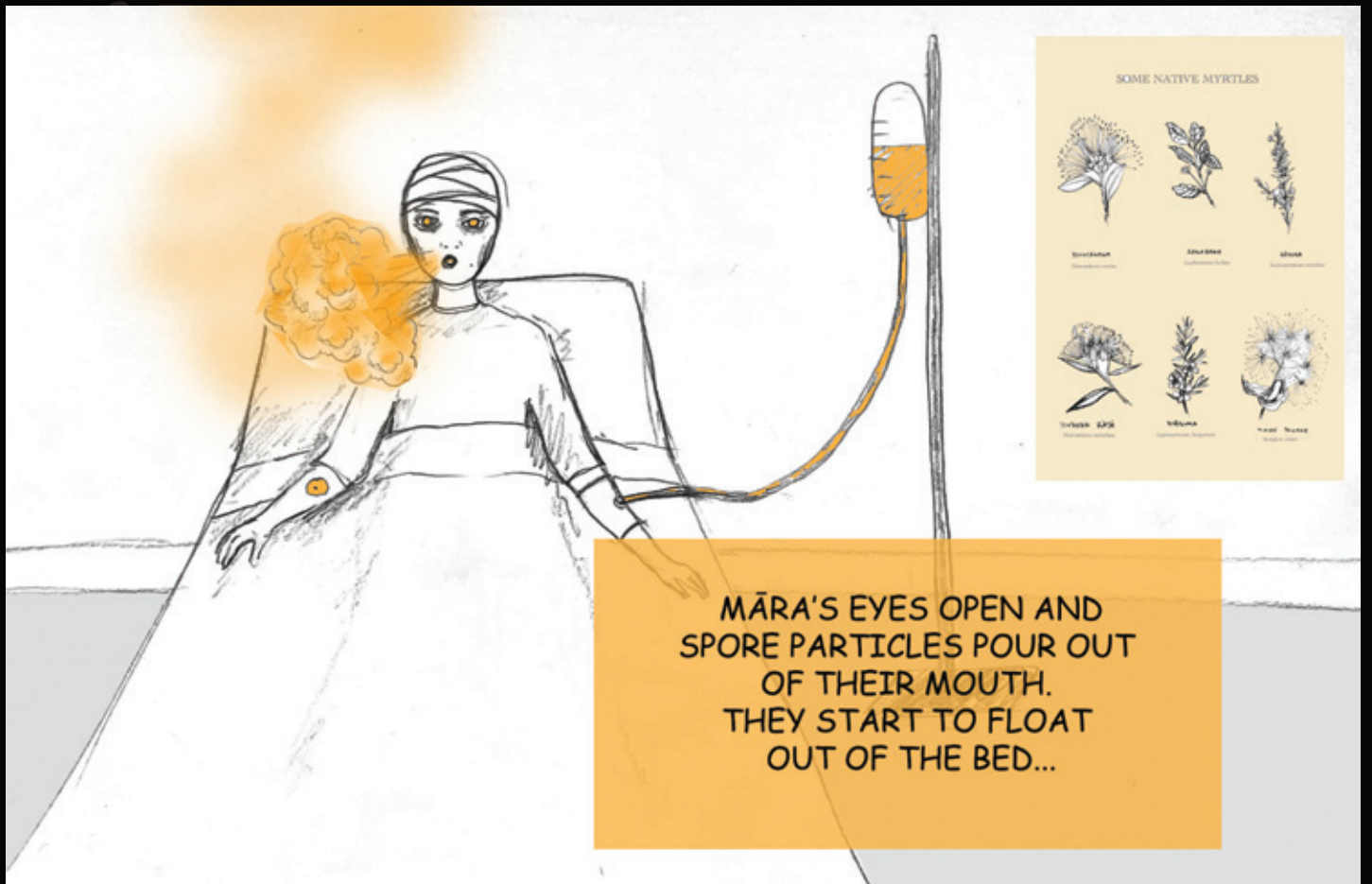
I'LL INJECT THIS FLUID STRAIGHT
INTO MĀRA'S BLOODSTREAM
AND WE SHOULD SEE A
REACTION WITHIN
THE FIRST TEN MINUTES...



TEN MINUTES PASS BY.
SLOWLY MĀRA STARTS
TO SHIVER...




THEN THEY CONVULSE
AND START COUGHING...






MĀRA!!!



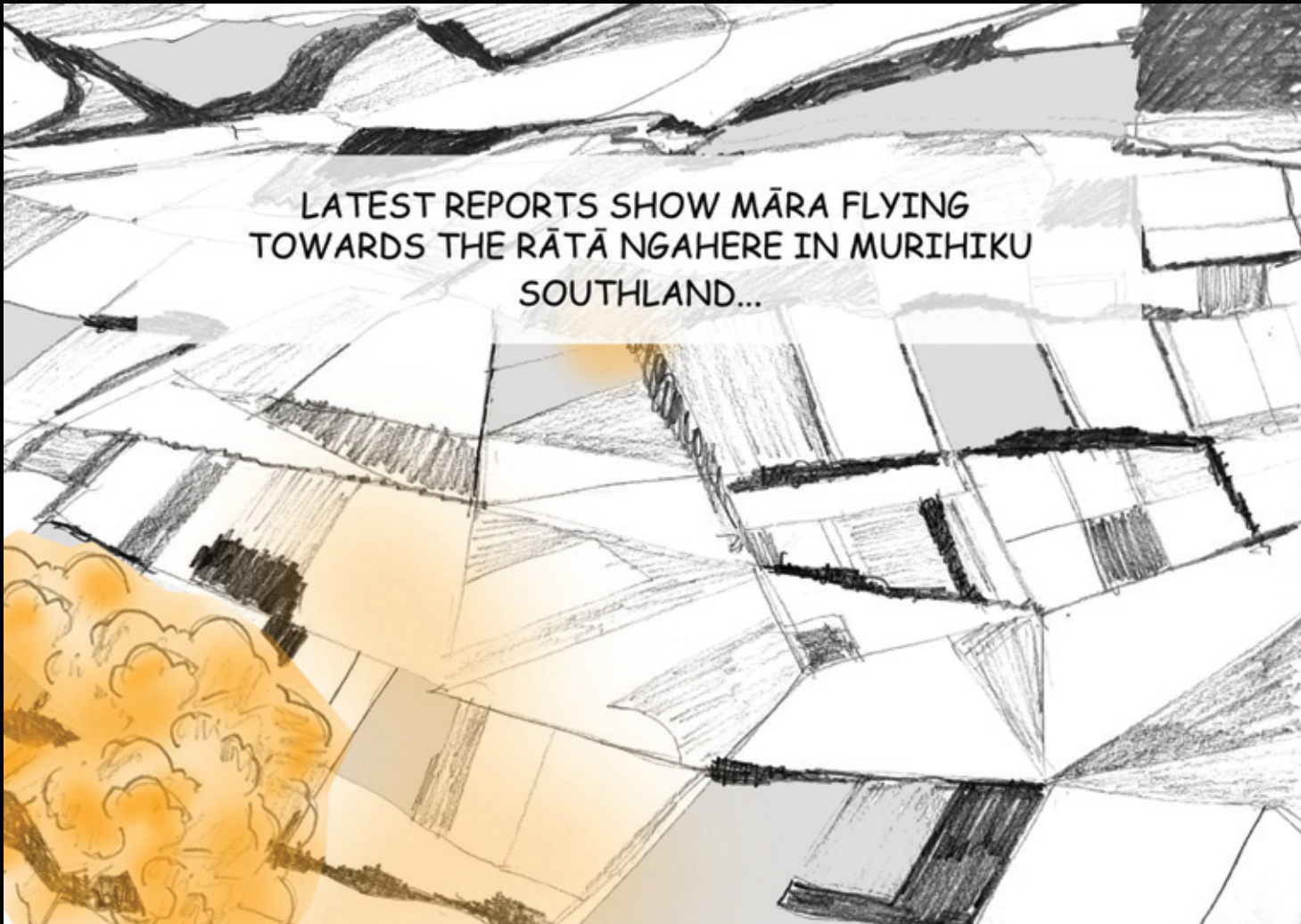
OH MY GOSH!!

THIS WASN'T
SUPPOSED TO
HAPPEN...

BREAKING NEWS



LOCAL STUDENT, MĀRA KARAKA WAS REVIVED FROM THEIR COMA WITH EXPERIMENTAL PLANT PATHOGEN TECHNOLOGY WHICH HAS GONE TERRIBLY WRONG. THE RUST FUNGUS HAS TAKEN OVER MĀRA'S MIND AND IS INTENT ON FINDING HOST PLANTS TO SPREAD THE PARASITIC RUST.



LATEST REPORTS SHOW MĀRA FLYING
TOWARDS THE RĀTĀ NGAHERE IN MURIHIKU
SOUTHLAND...

MEANWHILE...

IN A SECURE
LABORATORY
HIDDEN IN
TAMAKI MAKĀURAU...



...DATA KAITIAKI
HAVE BEEN TRYING
TO FIND AN ANTIDOTE
TO STOP THE SPREAD
OF MYRTLE RUST
THROUGHOUT THE
MOTU



TESTING CONTINUES,
VARIOUS COMBINATIONS
HAVE SHOWN DIVERSE
RESULTS...

THE ACTIVE PROPERTIES
OF *AUSTROPUCCINIA PSIDII*
ACCELERATE IN HUMID TEMPERATURES
BETWEEN 15° - 25° CELSIUS



WE ARE TRYING TO
SEE HOW THE RUST
SURVIVES IN DIFFERENT
ENVIRONMENTS...






MYRTLE RUST HAS STARTED SPREADING
THROUGHOUT AOTEAROA.

DATA KAITIAKI HAVE BEEN WORKING AROUND THE
CLOCK TO FIND A WAY TO STOP THE PARASITE
REACHING FURTHER MYRTACEAE POPULATIONS.

KAUMĀTUA AND MĀTAURAKA MĀORI
EXPERTS HAVE BEEN CONSULTED FOR
ADVICE AND SOME PROGRESS
HAS BEEN MADE...



NANNY J, A KAUMĀTUA AND
MĀRA MĀORI EXPERT FROM NGĀ PUHI
HAS LISTENED TO HER TĪPUNA
IN THE NGAHERE,
CREATING A STRONG KARAKIA TO
WARD OFF MYRTLE RUST
AND TO HELP MĀRA KARAKA
RETURN TO HER OWN
MIND AND BODY.



Auē te Manuhiri!

Haere mai ngā Atua

Ko kōrua wera Papatūānuku, Ranginui

Kia tata mai I ngā tamariki Atua

Ko koe tera e Tāne

Haere mai, haere mai

Auē te manuhiri!

He tapu wae koe ki tenei wāhi

Ko koe tērā Myrtle Rust

Haere mai haere e te manuhiri

Haere, haere, haere

Kia rapu atu te oranga

Mo koutou ma

I roto te mahanatanga o to matou māmā

Tawhiti mai Papatūānuku

Kei reira te oranga mo koutou ma

Haere mai haere

I roto te aroha o tenei te kaikōrero

Haere mai haere

I roto te aroha o Tāne Mahuta

Haere mai haere

I roto te arohatanga ngai tāngata ki a koutou

Haere mai haere

Āianeī te putanga

Ake nei ngā Atua

Kia noa te mutunga

Ka huri

To translate the karakia we acknowledge
the first Atua (gods) of the natural world
Ranginui (Sky Father) and
Papatūānuku (Mother Earth),
and we humbly ask for their assistance.

We then acknowledge Myrtle Rust as manuhiri (visitor).
This is because a guest is honoured and welcomed.

We are thankful for the warning sign
that has been gifted to us.

We then introduce a new direction for the fungus,
deep within the warmth
of the earth Papatūānuku (the mother).

We say to Myrtle Rust 'Haere mai haere'
you are welcome to go
with the love of the kaikorero (speaker),
with the love of Tāne-Mahuta (God of the Forest)
and the love of the people.

The mihi is closed with thanks given to nga Atua.

In order to benefit the ngahere
the personal commitment
to this karakia is that it must be actively
reinforced as often as possible.

By honouring this tikanga
we understand that acknowledgement is a pathway
towards whakawhanaungatanga with Te Taiao.

WHAT HAPPENED?
WHERE AM I??



MĀRA!!!

YOU'RE IN THE NGAHERE,
WE'RE HERE FOR YOU...



MĀRA WAKES UP FROM THEIR TRANCE
THANKS TO NANNY J'S KARAKIA.
THERE IS STILL WORK TO BE DONE TO
ERADICATE MYRTLE RUST AND THE
SCIENTIFIC COMMUNITY ARE WORKING
HARD TO FIND ANTIDOTES..
YOU CAN HELP BY CHECKING ON THE
MYRTLES IN YOUR COMMUNITY!

SOME ONLINE RESOURCES:

www.myrtlerust.org.nz
www.mobilisingforaction.nz
bioheritage.nz
toitaiaowhakatairanga.nz
thekauriproject.org.nz
www.plantandfood.com/en-nz/
www.landcareresearch.co.nz
www.sciencelearn.org.nz
www.mpi.govt.nz
auckland.ac.nz
otago.ac.nz

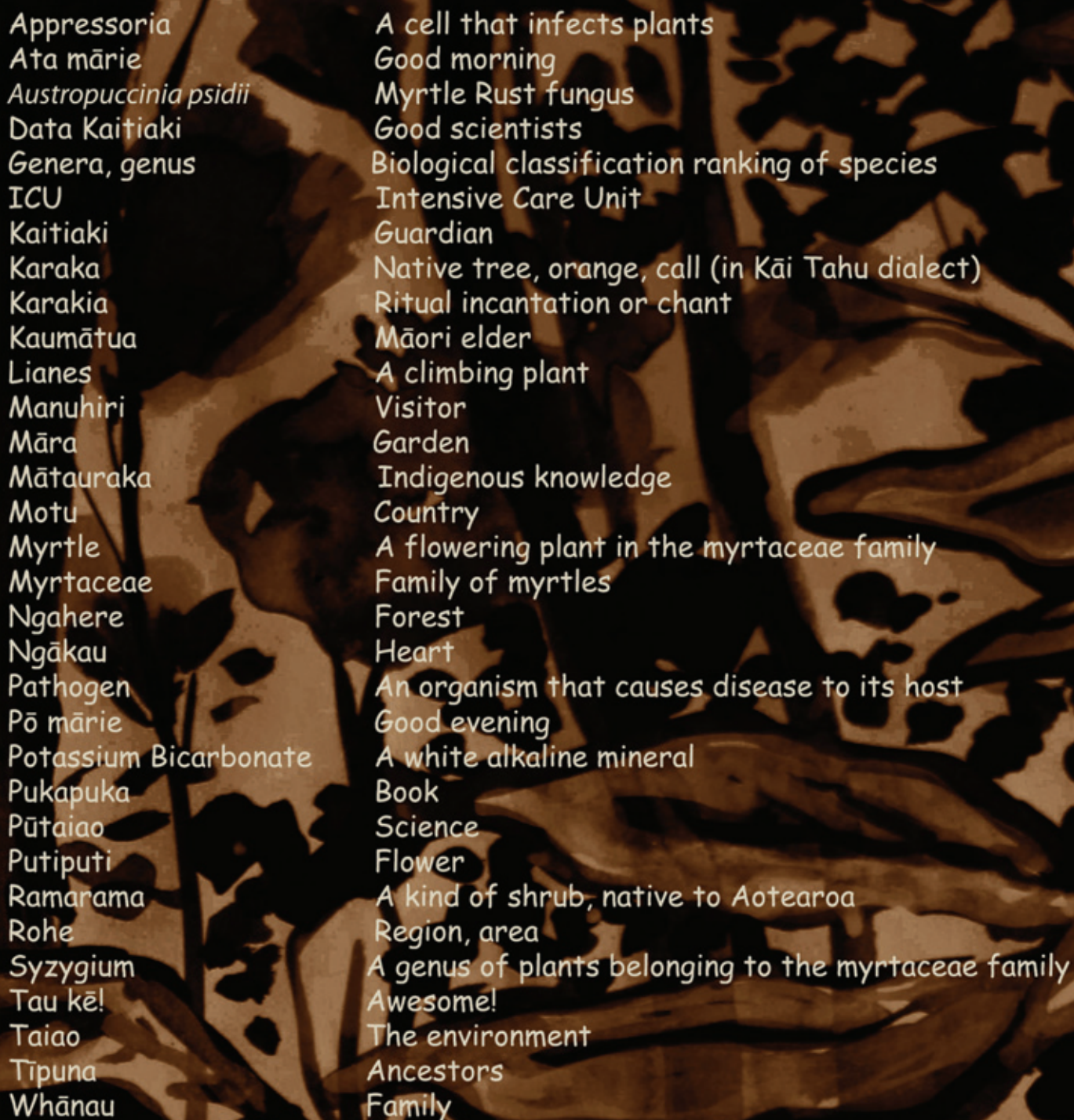
MYRTACEAE WHĀNAU:

THIS LARGE FAMILY INCLUDES 100 GENERA AND 3,000 SPECIES OF TREES, SHRUBS AND LIANES. THE MYRTACEAE ARE RECOGNISED BY THEIR ATTRACTIVE, FLUFFY PUTIPUTI WHICH HAVE A BASE NUMBER OF FIVE PETALS. MYRTLES ARE WOODY WITH ESSENTIAL OILS AND EVERGREEN LEAVES.

AOTEAROA HAS 37 NATIVE MYRTLES INCLUDING PŌHUTAKAWA AND RĀTĀ, MĀNUKA AND KĀNUKA, RAMARAMA AND SWAMP MAIRE. 25 OF OUR NATIVE SPECIES ARE ENDEMIC, WHICH MEANS THAT THEY CAN'T BE FOUND ANYWHERE ELSE IN THE WORLD.

TAU KĒ!

GLOSSARY OF MĀORI, SCIENTIFIC AND PLANT TERMINOLOGY



Appressoria	A cell that infects plants
Ata mārie	Good morning
<i>Austropuccinia psidii</i>	Myrtle Rust fungus
Data Kaitiaki	Good scientists
Genera, genus	Biological classification ranking of species
ICU	Intensive Care Unit
Kaitiaki	Guardian
Karaka	Native tree, orange, call (in Kāi Tahu dialect)
Karakia	Ritual incantation or chant
Kaumātua	Māori elder
Lianes	A climbing plant
Manuhiri	Visitor
Māra	Garden
Mātauraka	Indigenous knowledge
Motu	Country
Myrtle	A flowering plant in the myrtaceae family
Myrtaceae	Family of myrtles
Ngahere	Forest
Ngākau	Heart
Pathogen	An organism that causes disease to its host
Pō mārie	Good evening
Potassium Bicarbonate	A white alkaline mineral
Pukapuka	Book
Pūtaiao	Science
Putiputi	Flower
Ramarama	A kind of shrub, native to Aotearoa
Rohe	Region, area
Syzygium	A genus of plants belonging to the myrtaceae family
Tau kē!	Awesome!
Taiao	The environment
Tipuna	Ancestors
Whānau	Family

SOME NATIVE MYRTLES



PŌHUTAKAWA

Metrosideros excelsa



RAMA RAMA

Lophomyrtus bullata



KĀNUKA

Leptospermum ericoides



SOUTHERN RĀTĀ

Metrosideros umbellata



MĀNUKA

Leptospermum Scoparium



MAIRE TAWAKE

Syzygium maire