

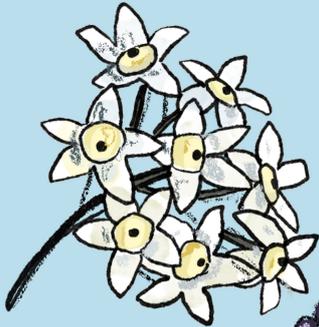
WHAT'S IN A NAME?

Indigenous plant naming and experimentation reveal a plant-insect relationship in New Zealand forests

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A common forest tree found all over Aotearoa New Zealand is this one - with many names. Its scientific name is *Carpodetus serratus*.



SMALL WHITE FLOWERS



SOFT PURPLE-BLACK BERRIES
RIPEN IN AUTUMN WITH
SMALL SEEDS INSIDE



EUROPEANS CALLED IT
"MARBLELEAF" BECAUSE OF
THE PATTERN ON ITS FOLIAGE

Scientists noticed something interesting about Māori names for this tree and decided to investigate further.



MĀORI NAMES FOR *C. SERRATUS* IN DIFFERENT REGIONS INCLUDE:

NORTH ISLAND
TE-IKA-A-MĀUI

TE UREWERA
(TŪHOE)

NAME USED: Putaputawētā

MEANING: Puta - to emerge. The double usage adds emphasis, suggesting lots of emerging.
Wētā - the insect.

SOUTH ISLAND
TE WAIPOUNAMU

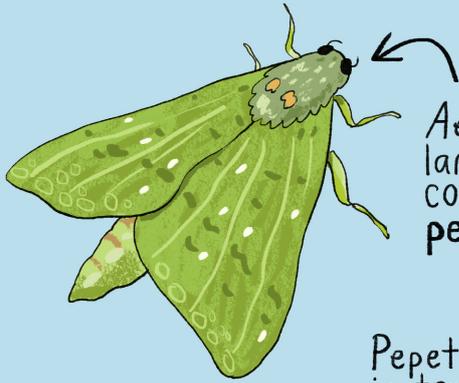
NAME USED: Kaiwētā

MEANING: Kai - food or feeding.
Wētā - the insect.

NAME USED: Piripiriwhata

MEANING: Piripiri - hanging ferns that often grow on tree trunks.
Whata - to be suspended.

WHY ARE WĒTĀ MENTIONED IN THE NORTH ISLAND NAME FOR THIS TREE BUT NOT IN THE SOUTH ISLAND NAME?

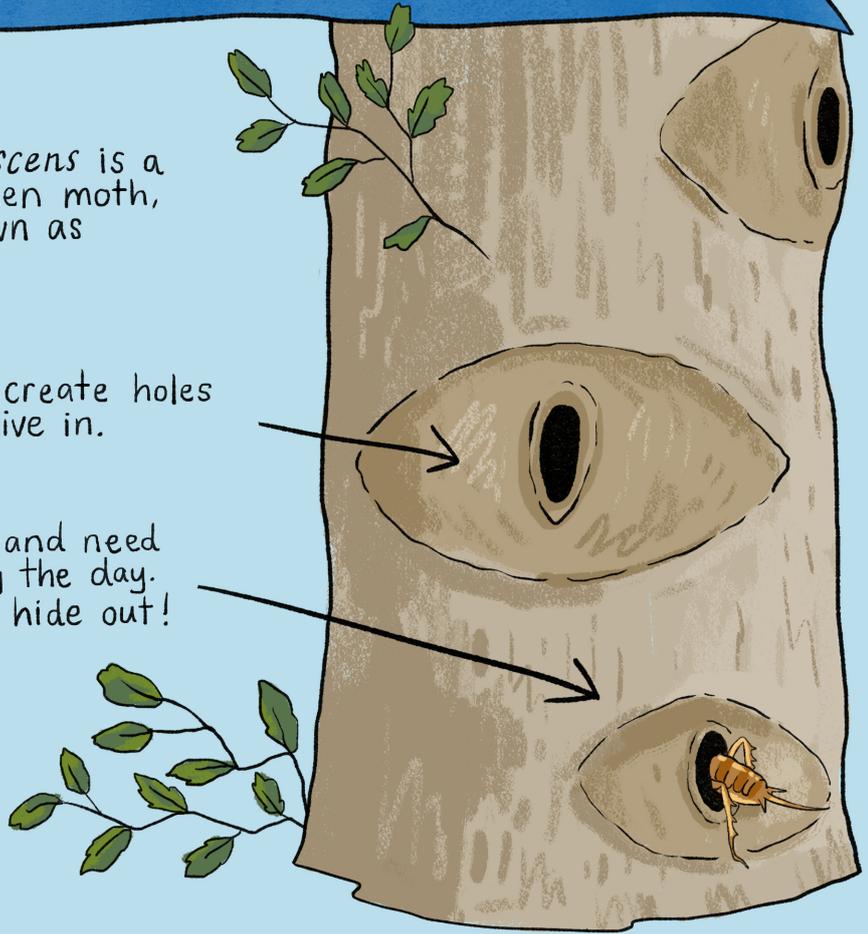


Aenetus viriscens is a large, hairy green moth, commonly known as pepetuna.

Pepetuna larvae create holes in tree trunks to live in.

Wētā are nocturnal insects and need a safe places to rest during the day. These holes make a perfect hide out!

Wētā living on *C. serratus* might eat more than 22 leaves every night in North Island forest.



PEPETUNA ONLY LIVE IN THE NORTH ISLAND!



SO where pepetuna make holes in *C. serratus* trees, wētā often live in those holes. They emerge at night to feed on the leaves of *C. serratus*. North Island Māori observed this phenomenon and named the tree accordingly.

In the South Island there are no pepetuna to make holes in the trunk of *C. serratus* so wētā have no reason to prefer *C. serratus* there.

This research comes from what is known as a **two-eyed seeing** approach to science. That means it combines Indigenous knowledge with "Western" scientific techniques to get a more complete picture.

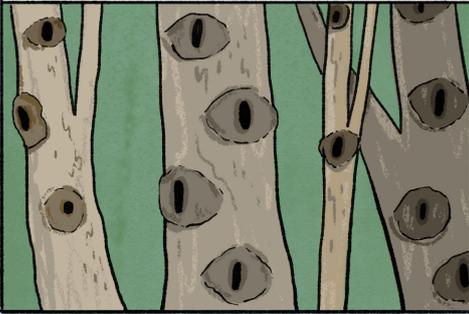
For this study scientists talked with iwi knowledge holders and searched historical manuscripts for information.



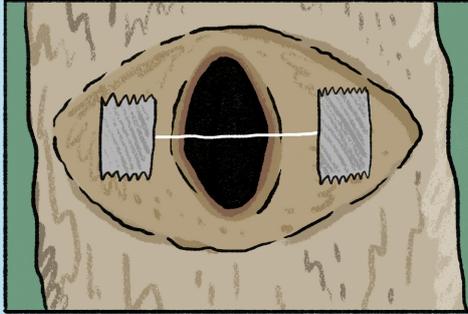
Using the information from the Māori names for *C. serratus* as a jumping off point, scientists did experiments to answer more questions.

HOW MANY PEPETUNA HOLES HAVE WĒTĀ INSIDE THEM?

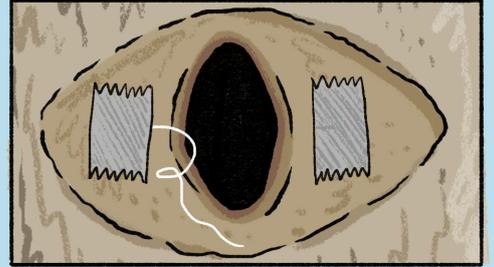
Scientists tagged and measured 100 holes in tree trunks.



Before dark, they placed a thread tightly across each hole.



In the morning, if the thread was hanging loose it meant that a wētā had pushed it aside.



HOW MANY LEAVES DOES A WĒTĀ EAT?



In the lab, a leaf is scanned on a photocopier.



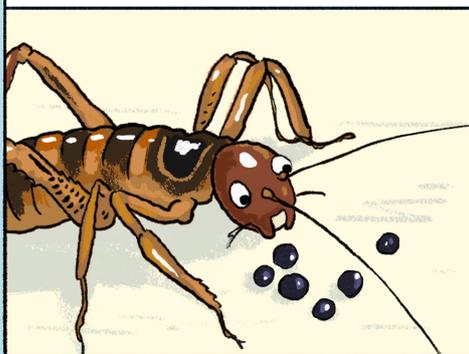
The leaf is given to a wētā to eat overnight.



In the morning the leaf is scanned again to see how much is missing.

DO WĒTĀ SPREAD SEEDS OR DESTROY THEM?

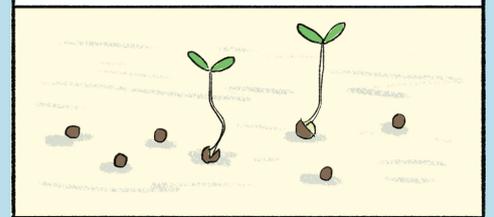
Wētā were fed berries from *C. serratus*.



Whole seeds were collected from the frass (poo) and counted.



Seeds from the frass were sprouted and compared to uneaten seeds to see which ones grew most often.



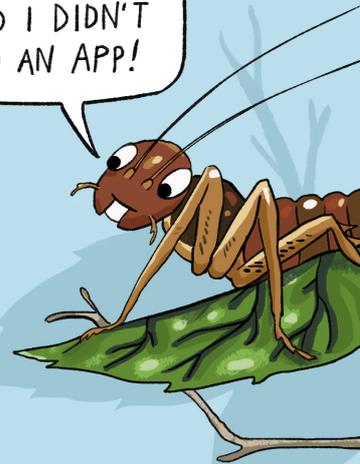
WHAT HAVE WE LEARNT FROM THIS STUDY?

✧ The Māori names for a common New Zealand tree led scientists to study the relationship between *C. serratus*, wētā and pepetuna.

✧ In the North Island *C. serratus* has more holes than any other type of tree, thanks to pepetuna. About half the holes measured were refuges for wētā during the day.

DINNER'S ON MY DOORSTEP EVERY NIGHT AND I DIDN'T EVEN NEED AN APP!

YOU'RE WELCOME!



I ONLY WEIGH ABOUT 6 GRAMS SO THIS IS A BIG MEAL!



✧ Because there are no pepetuna in the South Island, there are far fewer wētā living on and eating the *C. serratus* trees that grow there.

✧ A wētā can munch up to 500 grams of leaf matter per night!

✧ Wētā are seed predators. They destroyed almost all *C. serratus* seeds they ate. The few seeds that passed through a wētā didn't grow any more successfully than seeds that weren't eaten by wētā, but maybe there is a way that the tree benefits from being eaten that we don't know about yet!

WHERE ELSE CAN MĀORI ECOLOGICAL KNOWLEDGE LEAD US?

Acknowledgement:

Science is a collective effort. This work was conducted with whānau in Te Urewera and elsewhere. We acknowledge the traditional landholders of the forests - Tūhoe, Rangitāne, and Ngāi Tahu - and our many research assistants. Ngā mihi ki a Koutou katoa.