



吉娃斯愛科學繪本

排灣族語

第6集
看不見的牽絆

翻譯／配音

波宏明

吉娃斯愛科學

排灣族語版

第六集 看不見的牽絆



族語全文朗讀



英語全文朗讀



華語全文朗讀





na mapaselem a rapaljan



So Small You Can't See



看不見的牽絆





izua azua djinumak a ita a
qacengecengal a vatu, ni muni
ati vikal.



Giwas and Behuy found a little
black puppy.



muni 和 vikal 撿到一隻小黑狗。





pakakan tua azua vatu ti vikal, sa pinaka ti “kuma”.



Behuy fed the dog and named it Nalu. In the Atayal language, Nalu means “black bear”.



vikal 餵小黑狗吃東西，叫小黑狗 kuma。





kacuin a sema tjumaq azua ti kuma ni
muni, manu kacen ni kuma a cinepu a
kaliljav ni kina.



Giwas brought Nalu home. Nalu chewed
some cloth that Mother had woven.



muni 帶 kuma 回家。kuma 咬壞了媽媽
織的布。





manu makinamalji ti kina, sikatapuljuin
ti kuma sa sikavilad ni muni.



Mother got angry, so Giwas had to grab
Nalu and run away.



媽媽生氣了。muni 只好抱著 kuma 逃走。





uri sipavai a paquzip ti kuma tjay kangbi,
ljakua, ini a pusalu ti kangbi.



The two kids begged Bayan to adopt Nalu,
but he refused.



兩人拜託 kangbi 收養 kuma，但是 kangbi
不答應。





sasivaik a semapana a papavanav ti
kuma, “kadjav tukimadjuluanga tu izua
pusalu a paquzip.” aya ti muni ati vikal a
venarung.



Giwas and Behuy wanted to take Nalu
to the river for a bath. Maybe it would
be easier to find a new owner if he was
clean.



muni 和 vikal 想帶 kuma 去河邊洗澡。
也許乾淨的樣子比較容易找到新主人。





“maya kemacu tjay kuma a sivaik a semapana!” aya ti kangbi. palingi tu sawinanan a vaik a kiasav nua taruymu tu silevec.



“You can’t take Nalu to the riverside!” Bayan said nervously. He told them to get taro leaves to scoop water out of his water basin.



「不可以帶 kuma 去河邊！」kangbi 很緊張地說。一定要他們摘山芋葉回來舀水甕的水。





tja sasanguaq a salitjukutjuku a cinepis ni muni, tja sasakuya sa ladruadruq a cinepis ni vikal.



Giwas picked some clean taro leaves, light green, and round, with a shallow depression. Behuy picked dirty leaves, dark green, and longer with a deeper depression.



muni 摘的圓圓的葉子比較好，vikal 摘的長長的葉子比較不好。





pacung ti kuma, manu sakemac,
qecengen ni kangbi.



When Nalu saw the leaves, he tried to
chew on them too! Bayan stopped him
quickly.



kuma 看到葉子就想咬。Kangbi 急忙阻
止牠。





djaljepan nua qaynguway a asaw a
cinepis ni vikal, uri maciwdukitjen nu
tja kanen.



The leaves Behuy had gathered were
giant elephant's ear, which are
poisonous to eat.



原來 vikal 拿的是有毒的姑婆芋葉，吃
了會中毒。





“kemudaitjen a pacung tua asav nua taruymu?” aya ti muni.



“How can you tell the difference by looking at the leaves?” Giwas asked.



「只看到其中一種葉子時要怎麼分辨呢？」
muni 問。





“azua asav nua taruymu, izua azua pinakatua naymi, sika ini a kidjekecan nua zaljum.” aya ti kangbi.



“The surface of the taro leaves have fine nanoscale cilia hairs that cause water droplets to collect and roll around.” Bayan said.



「山芋葉子上面的奈米級纖毛讓水聚集成水珠，在葉子上面滾來滾去。」kangbi 說。





pacung a cuway a madruda, ini a makapacung. lemanda tua “naymi”, na malva ti vikal. kimaya sanguwanguwaq a kakanen aya.



The two kids looked closely, but couldn't see the hairs. Behuy got excited when he heard the word “nano” because he thought it was a delicious food.



兩人看了半天，看不出葉子上有毛。聽到「奈米」，vikal 很開心，以為是好吃的食物。





djemelii ti kangbi sa aya: “kedrikedriaravc
azua naymi, ini a mapacun.”



Bayan laughed and said: “A nanometer is
a very, very small measurement of length,
you can’t see it with the naked eye.”



kangbi 笑著說：「奈米是很小很小的長度
單位，用眼睛是看不出來的。」





manu namakuda a kinakedrikedri nua naymi?
“nu pikamavan tua inacap a asav nua taruymu,
kimaya paru quvalj ni kuma a naymi.” aya ti
kangbi.



How small is it really? Bayan said: “If the taro
leaf was as big as the ancient battlefield, the
cilia hairs would be the size of the smallest
hairs on Nalu’s body.”



奈米到底有多小？kangbi 說：「如果把山芋葉變成
像古戰場那麼大，葉子上的纖毛就變成像 kuma 身
上最細最短的毛一樣長。」





kumaya makaaya masan ludja a pinaka
naymi?



Why do the cilia hairs turn water into
droplets?



為什麼纖毛可以聚集水珠呢？





nutja celaken a asav nua taruymu, tja pacunan a liav a kakedrikedrian a paru djuidjui a nadjalut .



If you magnify the taro leaves, you can see that the surface is uneven. Each protruding structure has needle-like waxy structures 20 to 50 nanometers in size.



如果把山芋葉變很大來看，會看到葉子表面其實是凹凹凸凸的。每個凸出的地方，上面又有20個到50個奈米那麼小又像針一樣的蠟質東西。





ini a maseljudj a zaljum qatua djalualut a asav, mavan azua “naymi” a malain, sika azua zaljum, ini a tjengelay a kidjekec tua asav nua taruymu.



Water “doesn’t like” to touch those waxy structures.



水「不喜歡」和葉面上那些蠟質東西在一起。可是因為「奈米」的關係，水就更「不喜歡」貼在葉面上。





“manu tjaljakedrikedriananga naymi?
kumaya selapay a namayatazuwa?” aya
ti muni.



Giwas said: “Isn’t nano really small?
How can it have such a big impact?”



muni 說：「奈米不是很小嗎？有那麼厲害嗎？」





“azua i tua asav a naminequp, namapeljuq a djuidjui a nadjlaut, mavan azua sikaliavanga a meceving a zaljum qatua nadjalut.” aya ti kangbi.



Bayan said: “All of the protruding areas on the surface are full of nanoscale waxy needle-like structures, increasing the contact area with water, so the water doesn’t like to touch the leaf 's surface.”



kangbi 說：「葉面上每個凸出的地方上面又長滿奈米級像針一樣的蠟質東西，讓水和蠟質東西的接觸面積又更多更多了。」





ini a tjengelay a kidjekec katua nadjalut a naymi, sika azua zaljum namalitjuku i tua asav a maruquruqu, sa mavan azua sikasenasenav nua asav.



Because the water doesn't like to touch the waxy structures, the water on the leaves collects into droplets and rolls around on the surface. When the droplets roll off the leaf, they bring dust and dirt with them, so the leaf becomes clean.



因為不喜歡和葉面那麼多的奈米級蠟質東西貼在一起，葉面上的水就聚集成水珠，在葉面上滾來滾去。水珠從葉面滾下時，也順便把葉面的灰塵帶走，葉面變得很乾淨。







aicu a namayatucu, mavan a sangasangasan a mapacun i tua lianya. qumaya ciqav a sai a qaljic, namayatazua, sika tjadjaljav nu vaivaik!



This phenomenon was first discovered on lotus leaves, so it is called the lotus effect. Shark skin has the same effect, so sharks can swim really fast!



這種現象，最早是在蓮葉上發現的，所以又叫做蓮葉效應。鯊魚皮也有同樣的效果，所以鯊魚才可以游得很快！





manu na mayatucu! sa izua tiamadju
a namaleva a papavanavanav tjay
kuma.



So that's how it works! They all
happily gave Nalu a bath.



原來如此！大家開心地一起幫 kuma
洗澡。





tjengelay ti kuma tjay kangbi, izua
kiseljuseljudj tjay kangbi.



Nalu really liked Bayan and wouldn't
stop playing with him.



kuma 很喜歡 kangbi , 不停跟 kangbi 撒嬌。





saqetju a varung ni kangbi, mavaruug
timadju a kakedriananan, na seqaljud
azua ni madju a vatu a pinaka ti kuma.



Bayan became sad because he was
reminded of a dog named Nalu he had
as a kid who fell into the river.



kangbi 想起他小時候養的 kuma 掉進河
裡，讓他難過很久。





“na selapay a saqetjuan ti iljaw, saqetju a kuvarung, ljakua, kukinisumavanan ti iljaw.”
aya ti muni.



Giwas said: “Nainai once got really sick and I was sad too, but I took good care of him!”



muni 說：「iljaw 之前病得很重，我也很難過，但我很仔細的照顧 iljaw 喔！」





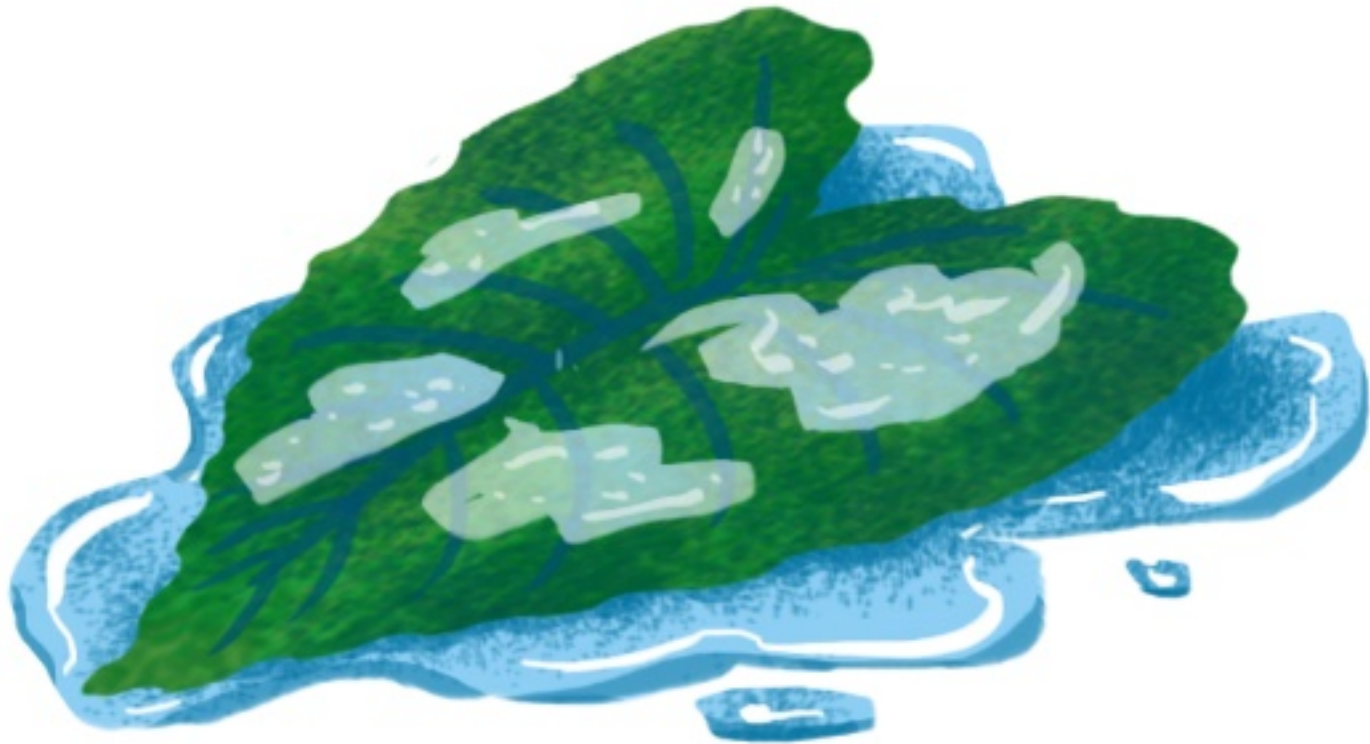
“kumaya a sisaqetju a tjialj ni iljaw?” aya ti kangbi. mavarung ti muni tu napatekel tua zaljum a pinitua “taruymu” a asav tjay iljaw.



Bayan thought that maybe Nainai had been poisoned, and Giwas remembered that she had used “taro leaves” to bring him water that morning.



kangbi 正懷疑 iljaw 是吃壞肚子時，muni 突然想起早上還用「山芋葉」裝水給 iljaw 喝。





Ijakua, azua sinilevec a asav, matu ini a
namalikupu a zaljum i tua a asav nua
“taruymu”.



But that “taro leaf” didn’t form water
droplets.



但是那片「山芋葉」好像不會聚集水珠？





tjaljamakinamalji ti iljaw, sa qemaung
a pagelic, manu maciyuduk tua
aynguway ti iljaw!



Nainai got angry and cried out.
Apparently Nainai had been poisoned
from the elephant's ear!



iljaw 很生氣，叫得更慘。原來 iljaw 中
了姑婆芋的毒！

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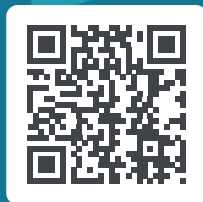
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