



吉娃斯愛科學繪本

卡那卡那富族語

第6集
看不見的牽絆

翻譯 / 配音 孔岳中

吉娃斯愛科學

卡那卡那富族語版 《Na'u 愛科學》

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





ka'anɬ roimiɬn parɬrɬ'ɬ cɬpɬngɬ



So Small You Can't See



看不見的牽絆







niatɬnɬ Na'u mataa Pa'ɬ ucani
ta'ɬrɬm tamtitu.



Giwas and Behuy found a little
black puppy.



Na'u 和 Pa'ɬ 撿到一隻小黑狗。







'apakənən Pa'ɬ sua tamtitu.
patanganaiən nguani "Kuru" kisɬən.



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



Pa'ɬ 餵小黑狗吃東西，他們為小黑狗取名
為「Kuru」。







niavici Na'u sua Kuru mutanasa. niara'isi
Kuru niata'isi cina ravini.



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



Na'u 帶 Kuru 回家。Kuru 咬壞了
媽媽織的布。







arakuracɥ cina! ariviɥn cu Na'u sua
Kuru manguru.



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



媽媽生氣了。Na'u 只好抱著 Kuru 逃走。

慢

原







musu'uvv nguani na Pori, tia 'apacuvvuvv
'inia Kuru. nakai ka'anv pakituru sua Pori.



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



兩人拜託 Pori 收養 Kuru，但是 Pori 不答應。







Na'u mataa Pa'ɬ marivici Kuru mukusa cakɬran parɬmɬcɬ. paɬpɬngɬ, tia masa'ɬcai masii 'una cau pakituru 'apacɬvɬrɬ 'inia.



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.



Na'u 和 Pa'ɬ 想帶 Kuru 去河邊洗澡。也許乾淨的樣子比較容易找到新主人。







“akuni mavici Kuru mukusa cakɤran!”
misee sua Pori. umaraa kani tanɤkɤ
tamna ranɤngɤ, matikauru pungana
tamna canumu.



“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 Kuru 去河邊！」Pori 很緊張地說。一定要他們摘山芋葉回來舀水甕的水。







nimara Na'u masa'ɬcai ranɬngɬ. tavacuku, takɬpɬ, 'una tavukunu. nimara Pa'ɬ cangkan ranɬngɬ, tavacuku, maraa macasɬ, maraa ta'ɬrɬm na tavukunu.



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.



Na'u 摘了很乾淨的葉子。粉綠色、圓圓的，凹的地方比較淺。Pa'ɬ 摘到髒髒的葉子。深綠色，葉子比較長，凹的地方比較深。







cumacʰʰra Kuru ranʰngʰ iisua, natia
raʼisiʰn kee. patikocʰʰn Pori.



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



Kuru 看到葉子就想咬。Pori 急忙阻止牠。







nguaiava sua naira Pa'ʈ ia, conu tamna
ranʈngʈ. 'una tuncu sua ranʈngʈ iisua.



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



原來 Pa'ʈ 拿的是有毒的姑婆芋葉，吃了
會中毒。







“tia pakʰnnanu cumacʰʰra ranʰngʰ
iisua?” kesoni Na’u.



“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？」
Na’u 問。







“sua tanɛkɛ tamna ranɛngɛ ia, 'una makai naimi kuncu, marikɛpɛ canumu, matakurikuri 'inia.” marivari sua Pori.



“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。」Pori 說。







'esi 'inia tassa taramanꞥngꞥ cumacꞥ'ꞥra.
'akia cꞥ'ꞥraa 'una 'inia kuncu. tinimana
“naimi” misee, macangarꞥ Pa'ꞥ! manasꞥ
sa'o'o kanꞥa misee.



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」，Pa'ꞥ 很開心，以為是好吃的食物。





maacaca Pori makasi: “sua naimi ia
ma’u’ura, kari sikacasɬ. ka’anɬ
ɬ’ɬrɬɬn vo’in.”



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



Pori 笑著說：「奈米是很小很小的長度
單位，用眼睛是看不出來的。」







makananu sikati'ingai sua naimi? makasi Pori:
“ucaniava noo makai tacangina sua ranꞰngꞰ.
sua kuncu iisua ia, tia makai na tina'an Kuru
kuncu sikacasꞰ.”



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？Pori 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 Kuru 身上
最細最短的毛一樣長。」







miseni tavara'ᵀ marikᵀᵀ canumu
sua kuncu iisua?



Why do the cilia hairs turn water
into droplets?



為什麼纖毛可以聚集水珠呢？







noo paratatia cumacʻʻra ranʻngʻ tanʻkʻ, 'esi
na rapatʻ in, tavukuvukunu. na tavukunu
iisua, 'una mapusan matarava maimʻʻn makai
naimi ti'ingai, tasiuru makai rusuku.



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。







“ka’an# manmaan” canumu na ran#ng# rusuku. vanai sii “naimi”, mastaan cu “ka’an# manmaan” matakici ’inia sua canumu.



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。





makasi Na'u: "ti'ingai sua naimi,
cucuru kara makasua ma'iintasɬ?"



Giwas said: "Isn't nano really small?
How can it have such a big impact?"



Na'u 說：「奈米不是很小嗎？有那麼厲害嗎？」







makasi Pori: “ravukuvukunu ranɛngɛ, 'una pa makai naimi tasiuru makai rusuku nonoman. mastaan cu mavakan matakici 'inia.”



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.”



巴彥說：「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。」







vanai sii ka'an# manmaan makasua nonoman.
marik#p# cu canumu makai tucu'u, 'esi na ran#ng#
matakurikuri. noo matapari'i cu tucu'u iisua ia,
avici#n kee na ran#ng# 'umpu, iimua masa'#cai cu
ran#ng#.



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。







sua makasia ia, nimu'uru'uru cʰʰrʰʰn na ranʰngʰ
rienye, iimua “rienye siau'ing” kisʰʰn. 'esi na
sayi, 'una kavangvang makasua. iimua mara'an sayi
makananguru!



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！







makasiava! macangaru nguani
parɬmɬcɬ Kuru.



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 Kuru
洗澡。







manmaan Kuru na Pori, ka'anꞥ
tarasangai sumasima'ꞥ mataa Pori.



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



Kuru 很喜歡 Pori，不停跟 Pori 撒嬌。







pacɤpɤngɤɤn Pori miaa tati'ingi pa,
nipacɤvɤrɤ tamtitu. nimatapari'i na
cakɤran, parɤrɤ'ɤ 'inia.



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



Pori 想起他小時候養的嘎魯掉進河裡，
讓他難過很久。







makasi Na'u: "me'inaan, nimusukɛmɛ
Ngɛkau. makasua aka cɛpɛngɛ. nakai
patimanɛngɛn maku miacara!"



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



Na'u 說：「Ngɛkau 之前病得很重，我
也很難過，但我很仔細的照顧 Ngɛkau
喔！」







pacɤpɤngɤ Pori, miaa musukɤmɤ Ngɤkau
tamna vɤcɤkɤ ia, surumu Na'u atanɤngɤ,
niarupaca ranɤngɤ mariu'u canumu 'apima
Ngɤkau.

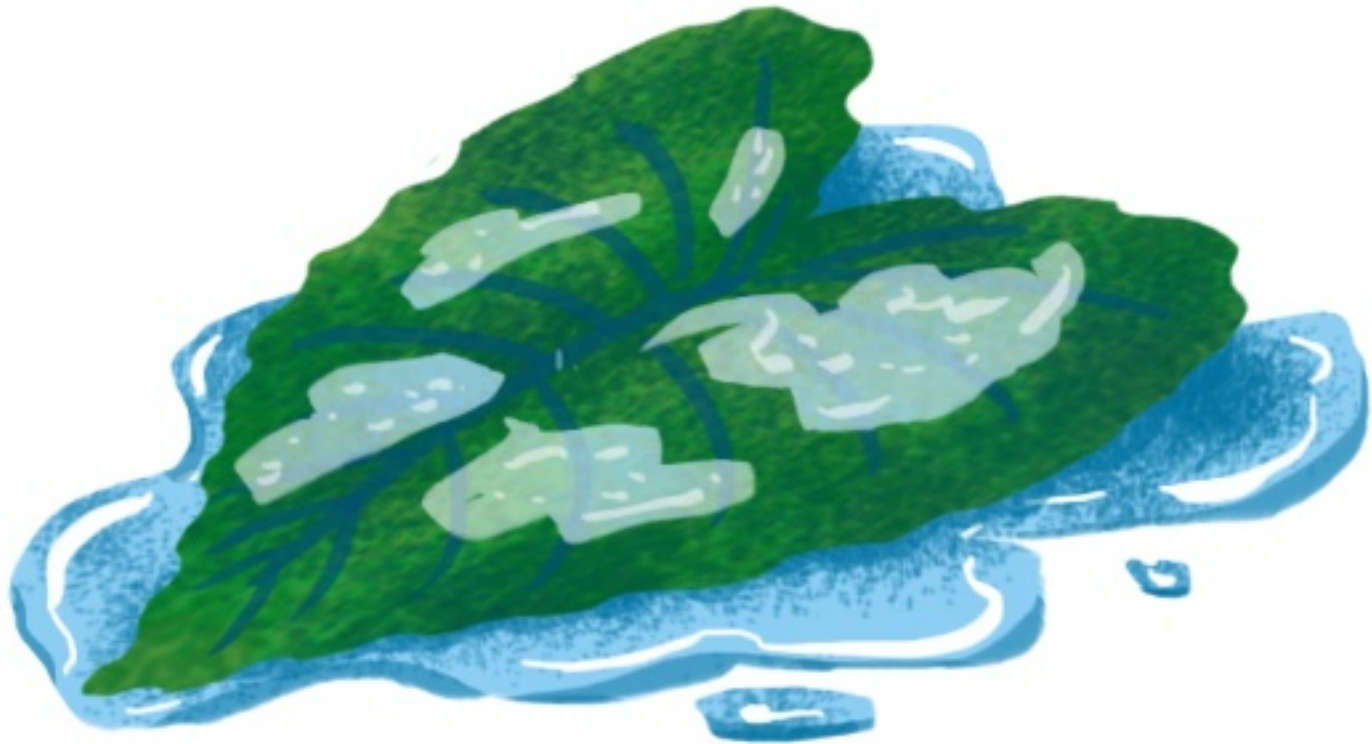


Bayan thought that maybe Nainai had been
poisoned, and Giwas remembered that she
had used “taro leaves” to bring him water
that morning.



Pori 正懷疑 Ngɤkau 是吃壞肚子時，Na'u
突然想起早上還用「山芋葉」裝水給
Ngɤkau 喝。







nakai ranɬngɬ iisua, makai ka'anɬ
marikɬpɬ tucu'u canumu.



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



但是那片「山芋葉」好像不會聚集水珠？







arakuracɥ Ngɥkau! masitatia muri'i.
nguaiava tinuncu ranɥngɥ conu!



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



Ngɥkau 很生氣，叫得更慘。原來
Ngɥkau 中了姑婆芋的毒！



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