



吉娃斯愛科學繪本

卑南族語

第6集
看不見的牽絆

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吉娃斯愛科學

卑南族語版 《蒂娃愛科學》

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





adri kurenauwan tu makiwalrayan



So Small You Can't See



看不見的牽絆







i Tiwa kay Ahuy i, atrebung dra
saya dra tutuy dra udreudrem.



Giwas and Behuy found a little
black puppy.



蒂娃和阿卉撿到一隻小黑狗。

慢

原







tu pakanay na tutuy na udreudrem kan
Ahuy. tu pungaladay kan Trumay. idru
na tutuy i, kamawan dra Trumay tu
ikaudreudrem driyama.



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



阿卉餵小黑狗吃東西，叫小黑狗「都賣」。
「都賣」在卑南語是「黑熊」的意思。





tu pilrangaw muruma i Trumay kan Tiwa.
idri Trumay i, tu tengisaw semiritr tu
tinatenun kan ina.



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



蒂娃帶都賣回家。都賣咬壞了媽媽織的布。







salaw ilremes i ina. i Tiwa i, tu
karabayaw i Trumay aw penuwar.



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



媽媽生氣了。蒂娃只好抱著都賣逃走。







nadru na miyadruwa i, baau i Trumay tu
kayaw i Sapayan i, adri muwai i Sapayan.



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



兩人拜託沙巴漾收養都賣，但是沙巴漾不答
應。







i Tiwa kay Ahuy i, maranger penilrang
kan Trumay muka padirusa i inayan. an
semalesal tu dradrek i, alra kalralreayan
ta atrebung dra trau dra kararuwa
benaaw.



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.



蒂娃和阿卉想帶都賣去河邊洗澡。也許乾
淨的樣子比較容易找到新主人。







“adri papilrangi i Trumay muka i inayan!”
kema malealab i Sapayan. adri kaadri muka
malaka dratu bira kana kabuiran muruma.
melraub kana enay i dinun tu kayaw nadru.



“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.



「不可以帶都賣去河邊！」沙巴漾很緊張地
說。一定要他們摘山芋葉回來舀水甕的水。





muka malaka Ira i Tiwa dra bira dra salaw
semalesal. parumiraat, mutralatralaw adri
makelrung. i Ahuy i, malak dra bira dra
miyakitral. miraaraat, belakalakas tu bira aw
makelrung.



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.



蒂娃摘了很乾淨的葉子。粉綠色、圓圓的，凹的
地方比較淺。阿卉摘到髒髒的葉子。深綠色，葉
子比較長，凹的地方比較深。







menau kana bira i Trumay i, maranger
dra muka temingisa. payas tu talaaw
kan Sapayan.



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



都賣看到葉子就想咬。沙巴漾急忙阻止
牠。







amau na miibulr na siadeng tu inalak
kan Ahuy. madadawak an mekan ta.



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



原來阿卉拿的是有毒的姑婆芋葉，吃了
會中毒。







“an saya ta ninauwan na bira i,
kuwadakuda ta malradram?” kema
kiyumalr i Tiwa.



“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？」
蒂娃問。







“na kabuiran tu bira i isatr na nay-mi gumulr i, tu parekerekepaw na enay mutu ulas. aw mukulukulung kana bira i isatr.” kema marengay i Sapayan.



“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。」沙巴漾說。





nadru na miyadruwa i, menaunau i, uniyana
dra gumulr i isatr kana bira. kilrengaw dra
“nay-mi” idri Ahuy i, salaw semangal. alra
amau a imaran a aekanan kema.



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」，阿卉很開心，以為是好吃的食物。







saeru marengay i Sapayan: “na nay-mi i,
a salaw makiteng a aipan. pakalranganay
kanta matra i, adri kurenau.”



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



沙巴漾笑著說：「奈米是很小很小的長度單
位，用眼睛是看不出來的。」







kemudakuda dra makitengan na nay-mi?
marengay i Sapayan: “anta patinakuanay kana
awatr patengetengedran tu ikatratrina kana bira
kana kabuiran i, tu gumulr i isatr kana bira i,
kamamawan kantu gumulr kan Trumay na
marasausautr aw maralriketriketri.”



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？沙巴漾說：「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都賣身上
最細最短的毛一樣長。」







daw na gumulr i, karuwa parekerekep
kana ulas?



Why do the cilia hairs turn water into
droplets?



為什麼纖毛可以聚集水珠呢？







anta katinayaw menau tu bira kana kabuiran i, nanau ta dra kelrukelrungan i makasasatr kantu bira. kana karasasa kana temuluus i, ulraya driya a makabetraan palru dra makalruwatr na nay-mi. makitengan kamawan dra daum na miimar.



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。







na enay i, adri “sagar” kurekasa kana ulraya
i isatr kana bira na miyaimar. amawna,
muka kanantu pinarekaimayan kana “nay-
mi” aw, na enay i, mangaleb adri “sagar”
muka dremeketra kana bira.



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。







“na nay-mi i, makiteng maku? amau kemadru dra makeseran?” kema i Tiwa.



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



蒂娃說：「奈米不是很小嗎？有那麼厲害嗎？」







marenaay i Sapayan: “na karesasa na temuluus kana bira i isatr i, ulraya driya a nay-mi na kamawan kana daum a miimar a manay. na enay aw na miimar na manay i, marekasadru tu inukasayan.”



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.”



沙巴漾說：「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。」







amau na adri sagar kurekasa kanadru na nay-mi na miyaimar i, na enay kana bira i isatr i, karakepekepel Ira na enay mutu ulas. aw mukulukulung kana bira i isatr. mukulukulung mutani na ulas i, parenarenangaw kemasu na trebulr. aw na bira i, bulay Ira aw semalesal Ira.



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。

慢

原







na kemadrini i, mukalradram kemay kantu bira kana
“liyēn” a palribak. driyama, a “liyē-yē-siyaw-ing”
kema. tu lubitr kana kuraw i, marisan kemadrini.
driyama arei melranguy na kuraw!



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！







amau a kemadrunu! kema nadrunu
aw semangal Ira mukasakasa tu
dirusaw Ira i Trumay.



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



原來如此！大家開心地一起幫都賣
洗澡。







sagar kan Sapayan i Trumay. adri
madradranga muka kareudena kan
Sapayan.



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



都賣很喜歡沙巴漾，不停跟沙巴漾撒嬌。







pakiyanger i Sapayan a makiteng driya
taytaw. tu binaaw i Trumay i, mulraud i
inayan. paetreetreng masepelr taytaw.



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



沙巴漾想起他小時候養的都賣掉進河裡，
讓他難過很久。







marengay i Tiwa: “a nguwayan i, pakireb
kualeng i Alian. salaw ku sipeleng.
amawna, ku kirungetraw menau emair i
Alian!”



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



蒂娃說：「阿力岸之前病得很重，我也
很難過，但我很仔細的照顧阿力岸喔！」







alrengetr i Sapayan kan Alian. alra mekan dra manay dra kuwatis nay? payas pakiyanger i Tiwa dra, a semaluwan i, Iraubanay dra enay tu bira kana “kabuiran”. tu patrekelay i Alian.

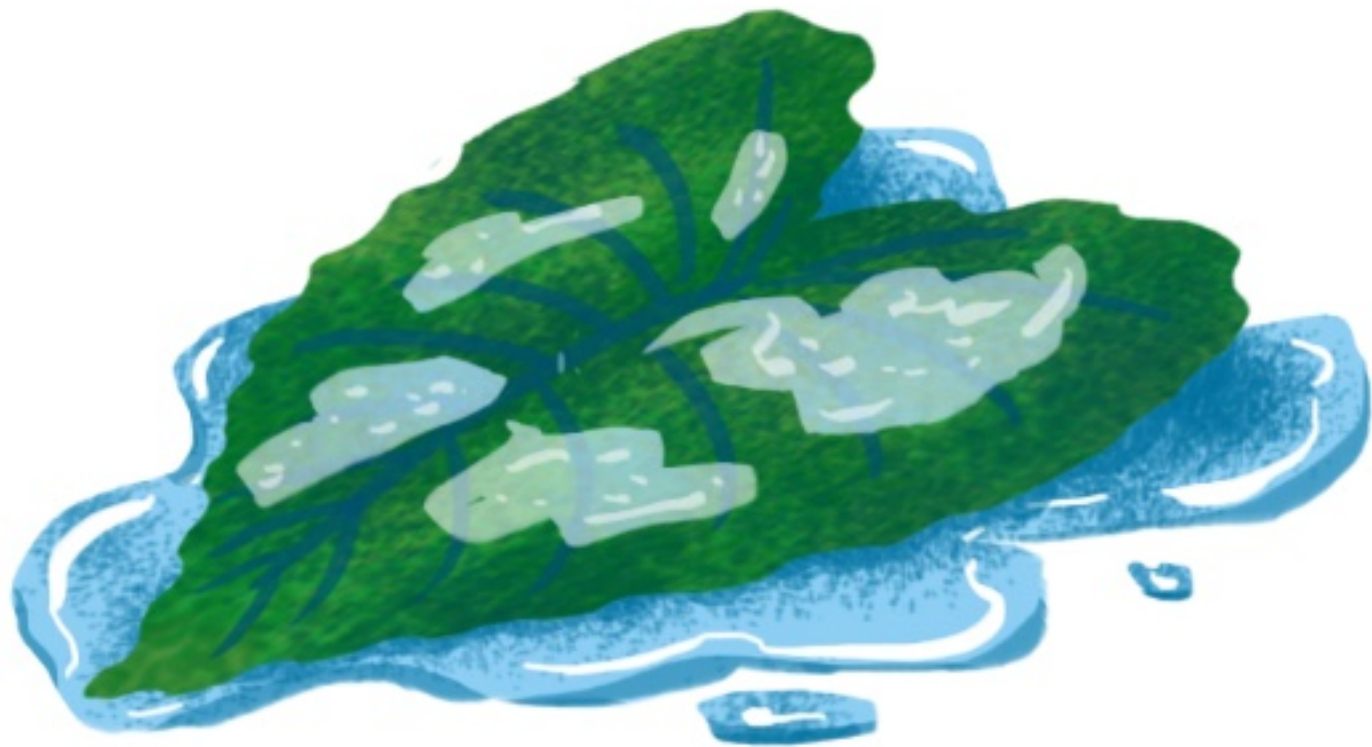


Bayan thought that maybe Nainai had been poisoned, and Giwas remembered that she had used “taro leaves” to bring him water that morning.



沙巴漾正懷疑阿力岸是吃壞肚子時，蒂娃突然想起早上還用「山芋葉」裝水給阿力岸喝。







amawna, idru tu bira kana “kabuiran” i,
kamawan dra adri karuwa parekerekep
kana ulas?



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



但是那片「山芋葉」好像不會聚集水珠？





salaw ilremes i Alian. aw pakireb
parenen. a panaan dra madawak kana
siadeng i Alian!



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



阿力岸很生氣，叫得更慘。原來阿力
岸中了姑婆芋的毒！

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第六集 看不見的牽絆

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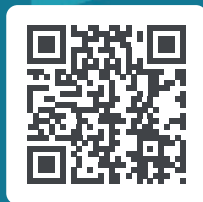
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 粉絲專頁



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