



吉娃斯愛科學繪本

布農族語

第6集
看不見的牽絆

翻譯 / 配音

卜袞·伊斯瑪哈單·伊斯立端

吉娃斯愛科學

布農族語版

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





Aldidiipaunang sia is'ang



So Small You Can't See



看不見的牽絆







Iduan dau a Ci'uas a mas Huipun
mas tasa tu matahdung tu luhi tu asu.



Giwas and Behuy found a little black
puppy.



吉娃斯和飛卉撿到一隻小黑狗。





Sikakaunan daus Huipuntia a luhi a at patingaan sia dau a luhi a tu “Kalu”. Mais palisTa’ialuun dau hai sintupa dau tu “matahdung tu tumaz.”



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



飛卉餵小黑狗吃東西，叫小黑狗「嘎魯」。
「嘎魯」在泰雅語是「黑熊」的意思。





Adasun daus Ci'uastia a Kaluan kaulumah
hai kalatun daus kalutia mapinku'ang
a itutinatia a tinindunin a mahaiav a.



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



吉娃斯帶嘎魯回家。嘎魯咬壞了媽媽織的布。





Ankaputun daus Ci'uastia Kalu a
matisbai mudaan i tinhaunguin a tina a.



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



媽媽生氣了。吉娃斯只好抱著嘎魯逃走。





Tupaun daus dadusatia a Paian a tu
sizaav saipuk a Kaluan hai nii dau a
Paian a istala.



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



兩人拜託巴彥收養嘎魯，但是巴彥
不答應。





Asaun daus Ci'uastia mas Huipuntia a Kalu mapatal'isuh sia vahlas i miliskin dau a naia tu adu mais pisaningsingunin mapatal'isuh hai adu na kazimaunis bunun hai?



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.



吉娃斯和飛卉想帶嘎魯去河邊洗澡。也許乾淨的樣子比較容易找到新主人。





Tupaun daus Paian a naia tu “kakaa tu adasun a Kalu a kauhahlas mapatal’isuh!” Ung at, kasaan tu kaudiipa sizas na is’isul danum sia amunu tu baial tu silav.



“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.



「不可以帶嘎魯去河邊！」巴彥很緊張地說。一定要他們摘山芋葉回來舀水甕的水。





Usizaan dau a Ci'uas a mas masanglavsanglav tu masaningsing tu ma'ailaduladu tu makanii tu mahatu tu silav at usizaan dau a Huipun a mas ku'isnah tu masanglav tu maduludulu tu maka'isngadahan tu mahatuan tu silav.



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.



吉娃斯摘了很乾淨的葉子。粉綠色、圓圓的，凹的地方比較淺。飛卉摘到髒髒的葉子。深綠色，葉子比較長，凹的地方比較深。





Masa sadu dau a Kalu a mas silavtia hai
na asa isnadii kalat at pantisan daus
Paiantia tu.



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



嘎魯看到葉子就想咬。巴彥急忙阻止牠。





Tupa tu maaz a siniza daus Huipuntia a baila a silav a hai aizaan daus babas at na basun dau a bununis maun.



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



原來飛卉拿的是有毒的姑婆芋葉，吃了會中毒。





Tupa Ci'uas a tu “na pikun a siaan sadu tu mamaaz a niaanis ka tasa a silav a saduan i ?”



“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？」
吉娃斯問。





“maaz dau a maka’apaav sia baial tu silavtia a madadisdis tu ngisngis a saikasnaimi a hai pin’uniun sia dau a danum a mas mazumu tu pis’azu’azu sia silavtia tu danum.”



“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。」巴彥說。





Samamantukan daus dadusutia a silav hai mikui ukas saduan tus maaz tu mangisngisngisngis tu. Ung at manaskal dau a Huipun a tu ta'aza mas "naimi" i makas'ang a saia tu kakaunun a sia dau.



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」，飛卉很開心，以為是好吃的食物。





Malngingit a Paian a tupa tu “maaz a Naimian hai sia dau mas ispakakatnul mas kaiduluan. Nii dau saduanis kumataan sadu.”



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



巴彥笑著說：「奈米是很小很小的長度單位，用眼睛是看不出來的。」





Ung i sikaskua bis itunaimitan a kaisikitan i? Tupa a Paianan tu “mais paluszangun a itubaialtia a silav a mas pailkapapaatazan habastan sadu hai maaz a itusilavtia a ngisngis’ikit a hai na maszang mas ituKalutia tu isia lutbtia tu mastanin tu maputul tu huspiltia mais saduan.”



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？巴彥說：「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嘎魯身上最細最短的毛一樣長。」





Maivia tu mahtu a mazadisdis tu
ngisngisan mapinzumus danum is?



Why do the cilia hairs turn water
into droplets?



為什麼纖毛可以聚集水珠呢？





Mais pindaingunta a itubaialtan a silavan sadu hai maaz a isaitia a silavan hai ni bis sia mahatuhatu tu mabauknubauknu i! Ung at, maaz dau a tasatasa a mababauknuan hai aizaan dau amin tu mapus'an saumaimaun mas sikasnaimitia ikit tu maszang mas is'as tu hanit i!



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。





Aupa maaz dau a danuman hai “nii tu mazima” mas isia maka’apaav sia silavtia tu madazisdis tu huspil. Ung at, tis’unis “naimi”tia at mastanin dau a danumanan tu “nii tu mazima” talinasiaan sia silavtia talipdat.



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。





Tupa dau a Ci'uas a tu “kaumasikit
aupa a naimian hai maivia tu
matamasaz tu?”



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



吉娃斯說：「奈米不是很小嗎？有那麼
厲害嗎？」





Tupa a Paianan tu “maupa maaz a maka’apaav sia silav a mabauknuan hai supahas sikasnaimitia tu maszang is’as tu hanit at maaz a danuman hai mastanin tu madaingin a saikasmaazdaing tu pailisdamuan.”



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。」





Aupa maaz a danuman hai nii tu mazima mapasipdatsipdat mas supah tu hanit hai sizumuzumu minmazumuzumu tu danum pis'azu'azu siaan silavtia.

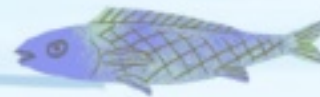
Ung at, mais pis'azu'azu a danuman hai si'azusun a pushuan sinananstu at minmasaningsingin a maka'apaav silavan.



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。





Maaz a saiduas maupatan hai inisiaan
dau sia tupaun tu lian'iitia satangus sadu
at pahasia tupaun dau tu lian'ii siau'ing.
Maupatia dau a sa'iu a amin at pahasia
mabiskav a isatia a sinunghahaulan i!



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！





Maupatia hang a sia! Ung at, manaskalin a naia mapatal'i'isuh mas Kalutia.



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



原來如此！大家開心地一起幫嘎魯洗澡。





Mazima dau a Kalu a mas Paiantia at
mintau'auva'auva siaan Paiantia.



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



嘎魯很喜歡巴彥，不停跟巴彥撒嬌。





Makuang a isPaiantia a is'ang tu
tinliskin mas lainangadah sia vahlas
tu sinaipuk sia tu Kalu.



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



巴彥想起他小時候養的嘎魯掉進河裡，
讓他難過很久。





Tupa a Ci'uas a tu “masa mindahpa a Nainai a aitu hai makuang amin a inak a is'ang tudiip. Hai tu pisi'alunku a saia ma'angkut tudiip!”



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



吉娃斯說：「乃奈之前病得很重，我也很難過，但我很仔細的照顧乃奈喔！」





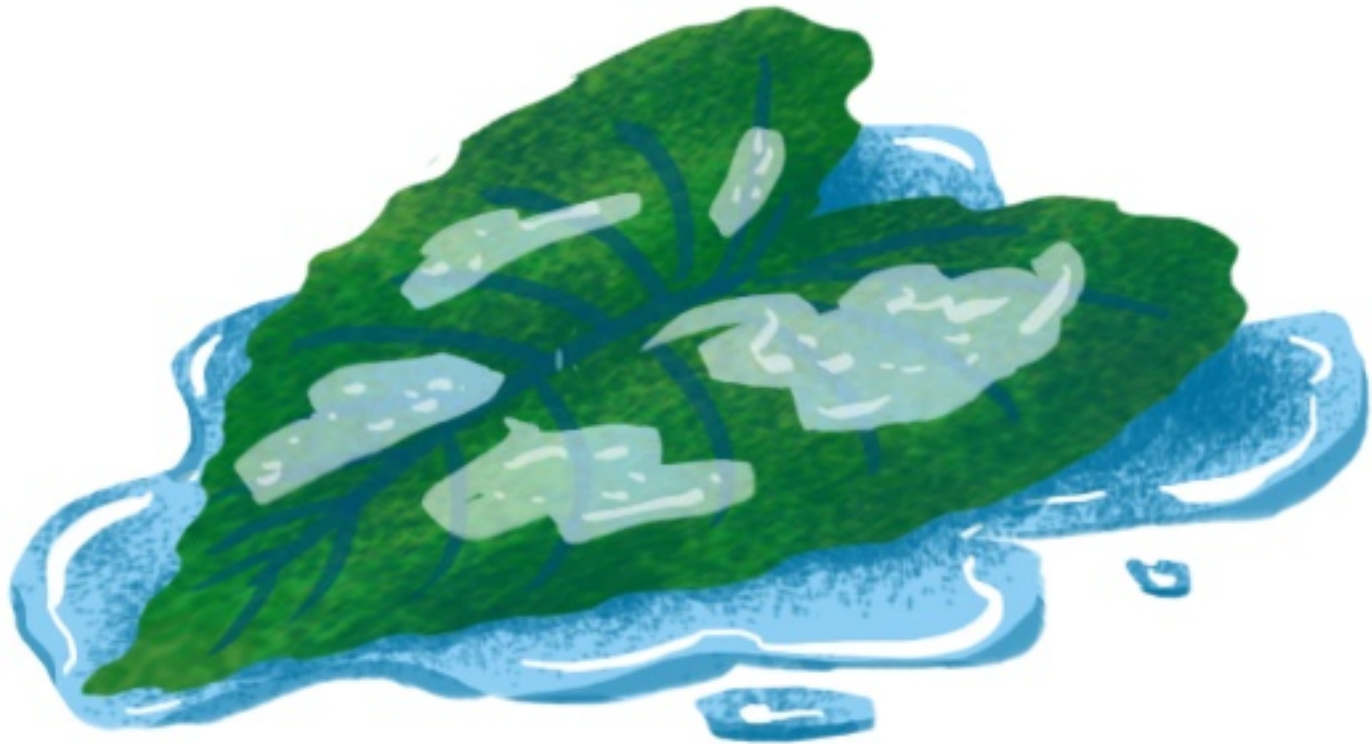
Mashadang a Paian a tu adu pankulaan a Nainai a. Ung at, tinliskin a Ci'uas a tu maani maiku “baial” a saia mapahud mas Nainaitias danum.



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



巴彥正懷疑乃奈是吃壞肚子時，吉娃斯突然想起早上還用「山芋葉」裝水給乃奈喝。





Hai tu maani nii tu si'azumu a isia itu
“baial” tia a danum a?



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



但是那片「山芋葉」好像不會聚集水珠？





Masupnuhdaingaz a Nainai a at
tutushit dadaling i baasun a saias
maivus tu silav tu baialtia!



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



乃奈很生氣，叫得更慘。原來乃奈
中了姑婆芋的毒！

《吉娃斯愛科學》- 布農族語版

第六集 看不見的牽絆

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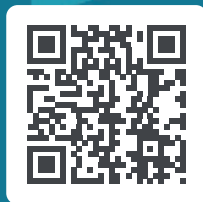
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 粉絲專頁



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