

BRISBANE BUSHWALKERS

STINGING TREES

**BOTANY
HAZARDS AND
TREATMENTS**

Paul Hinkley
BBW Member & Leader

DISCLAIMER

- I'm not an expert in this matter
- I've relying on information from others whom I presumed to be experts but all stated stinging trees and first-aid treatments were not fully understood and thus their knowledge was incomplete and not necessarily reliable!
- I welcome hearing of any first-hand experiences of BBW members that might add to our understanding: paulh9900@gmail.com

BBW CLUB DISCLAIMER:

This is General Information only. It is not Medical Advice. If you believe you have been stung, seek medical advice and treatment from a Medical Practitioner or call '000'. Any self medication based on this or any other information is at your Own Risk. Do not accept advice or treatment from a BBW Leader or BBW Member – they are not qualified.

BACKGROUND

- Since 2008 I have been regularly walking in South-East Queensland & Northern Rivers
- I have experienced several brushes with stinging trees that affected me locally for an hour so...
- I was motivated to research the topic in November 2021 when I heard of a BBW member having a very painful reaction to a tree sting that lasted several days
- Another BBW incident in January 2022 confirmed my research was timely
- I read some online bizarre and terrifying stories, starting from 1865!
- Ideas of recommended treatment varied wildly

PRESENTATION AIMS

- To review information sources
- To familiarise ourselves with the botany of the 4 species of stinging trees found in Queensland and NSW
- To review the range of reactions from mild to excruciating
- To speculate on why different people have different reactions
- To review the range of treatments people have used

INFORMATION SOURCES

- **Dr Marina Hurley, University of New South Wales**
<https://www.writingclearscience.com.au/wp-content/uploads/2015/06/stingers.pdf>
<https://theconversation.com/the-worst-kind-of-pain-you-can-imagine-what-its-like-to-be-stung-by-a-stinging-tree-103220>
www.abc.net.au/radio/northcoast/programs/saturday-breakfast/stinging-tree-pain-venom-rainforest/13594818
- **Dr Murray Haines, ex-BBW member**
(now residing in NSW)
Directed me to Cape Tribulation Tropical Research Station blog – see below
- **Hugh Spencer, Director, PhD**
Cape Tribulation Tropical Research Station
Previously Australian Tropical Research Foundation (AUSTROP)
<http://austrop.org.au/>
Blog: *Stinging trees and new treatment:*
<http://capetribresearchstation.blogspot.com/2010/03/stinging-trees-and-new-treatment-for.html?m=1>
Hugh is a neurobiologist by training
- **BCC Mt Coot-tha Library (Botanical Gardens)**
Botany Reference Section

INFORMATION SOURCES

ONLINE ARTICLES

Marina Hurley, PhD University of New South Wales

<https://theconversation.com/the-worst-kind-of-pain-you-can-imagine-what-its-like-to-be-stung-by-a-stinging-tree-103220>

www.abc.net.au/radio/northcoast/programs/saturday-breakfast/stinging-tree-pain-venom-rainforest/13594818

<https://www.writingclearscience.com.au/wp-content/uploads/2015/06/stingers.pdf>

Australian Geographic

Gympie Gympie: Once stung, never forgotten

AMANDA BURDON • June 16, 2009

www.australiangeographic.com.au/topics/science-environment/2009/06/gympie-gympie-once-stung-never-forgotten/

Factsheet: Gympie Gympie

Lydia Hales • February 4, 2014

<https://www.australiangeographic.com.au/topics/science-environment/2014/02/factsheet-gympie-gympie/>

INFORMATION SOURCES

ONLINE ARTICLES (Continued)

Australian Geographic (Continued)

Australia's most poisonous plants

Sylvia Varnham O'Regan • July 4, 2012

[9 of the most poisonous plants in Australia out of 1000]

<https://www.australiangeographic.com.au/topics/science-environment/2012/07/australias-most-poisonous-plants/>

Similar article in the **Courier Mail**: February 6, 2014

Gympie-Gympie stinging tree in focus

www.couriermail.com.au/news/queensland/gympie/gympiegympie-stinging-tree-in-focus/news-story/

Smithsonian Institute

How Venomous Australian Stinging Trees Cause So Much Pain

www.smithsonianmag.com/smart-news/how-venomous-australian-stinging-trees-cause-so-much-pain-180975877

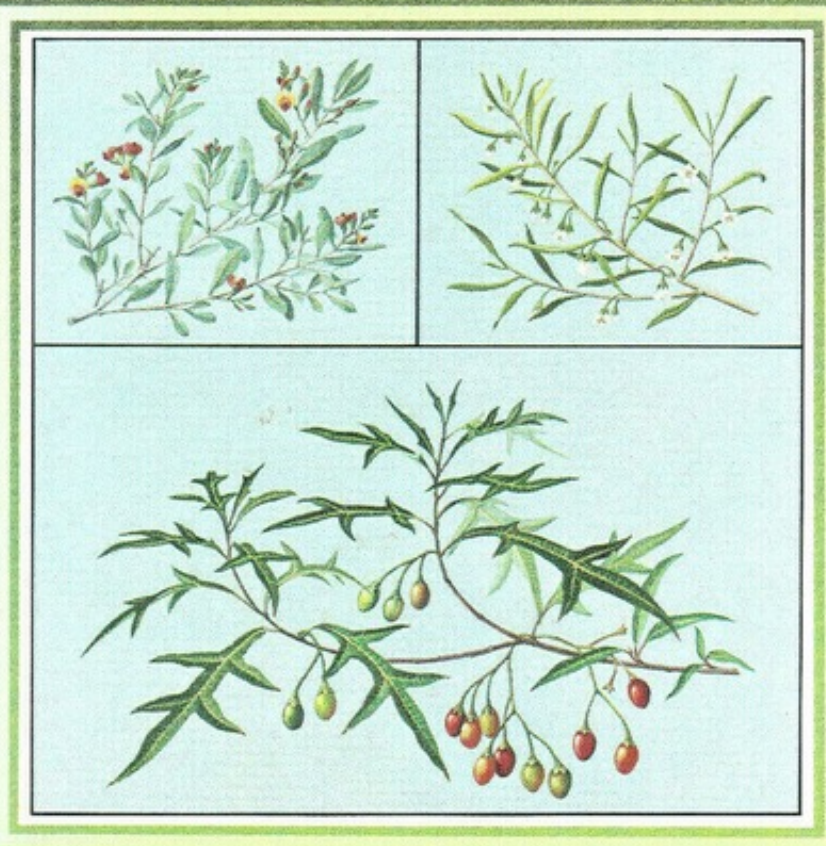
Discovery.com/ Curiosity.com

Reuben Westmaas *The "Suicide Plant" Has the Most Painful Stingers in the World* www.discovery.com/nature/Suicide-Plant first published curiosity.com

THE REVISED EDITION
OF THIS DEFINITIVE WORK

POISONOUS PLANTS OF AUSTRALIA

SELWYN L. EVERIST



AUSTRALIAN NATURAL SCIENCE LIBRARY

INFORMATION SOURCES #2

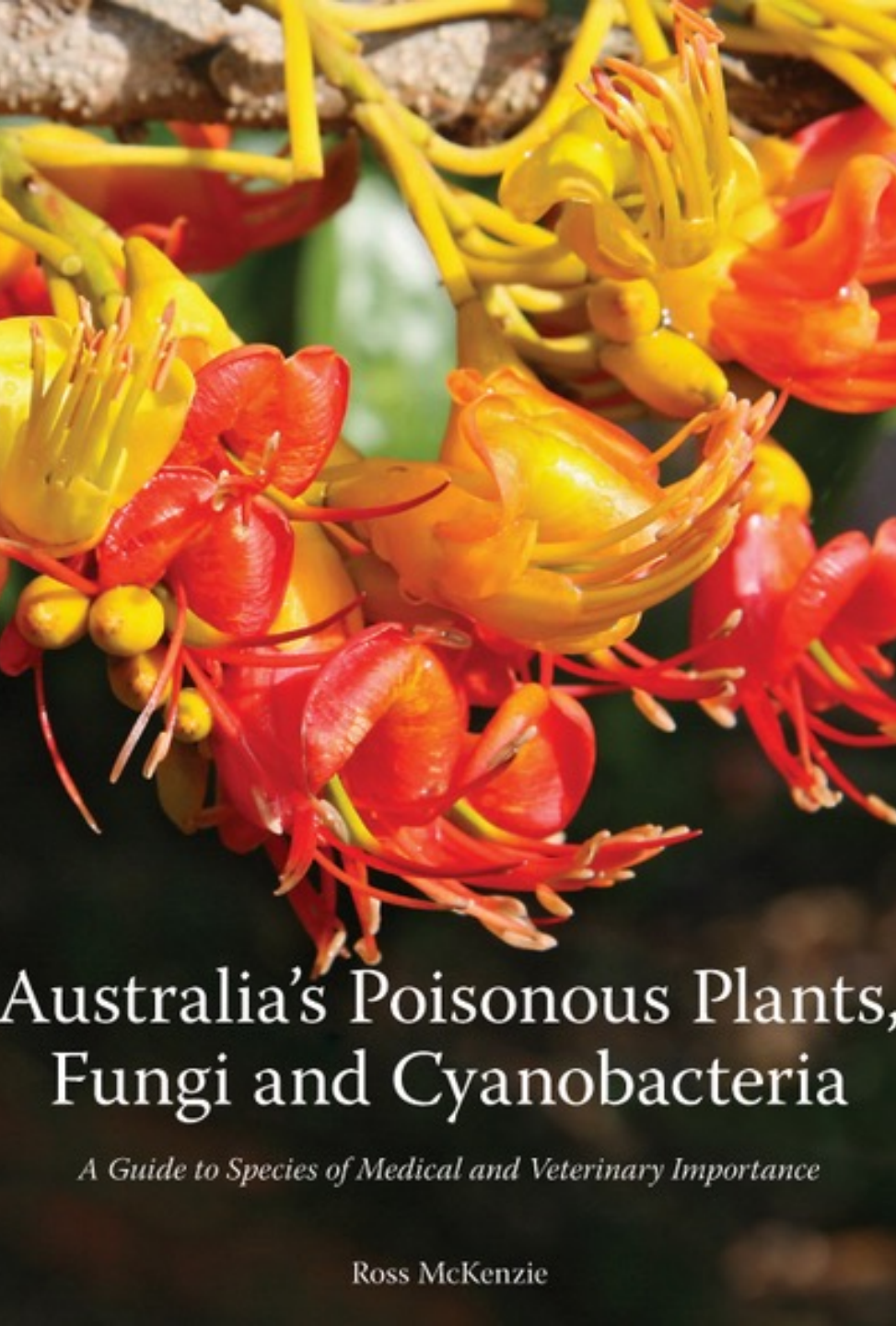
Poisonous Plants of Australia Selwyn Everist

Angus & Robertson
2nd Edition January 1981
Originally published 1974
966 pages

Reference copy available from the
Mt Coo-tha Library

Selwyn Lawrence Everist (1913-1981)
botanist, born Tewantin, Queensland
<https://adb.anu.edu.au/biography/everist-selwyn-lawrence-12470>





INFORMATION SOURCES #3

Australia's Poisonous Plants, Fungi and Cyanobacteria – A Guide to Species of Medical and Veterinary Importance

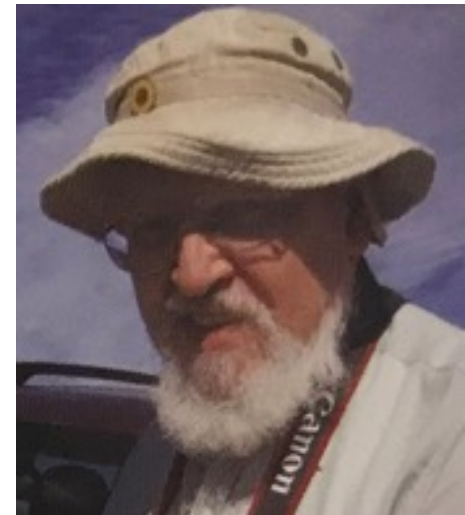
Ross McKenzie PhD
(retired veterinary pathologist)

CSIRO Publishing, Collingwood, Vic

Hardback 2012; eBook May 2020 \$128

www.publish.csiro.au/book/6507/

Hardback: BCC Mt Coot-tha Library
(Botanical Gardens) Reference Section:
pages 637-643; 813





INFORMATION SOURCES #4

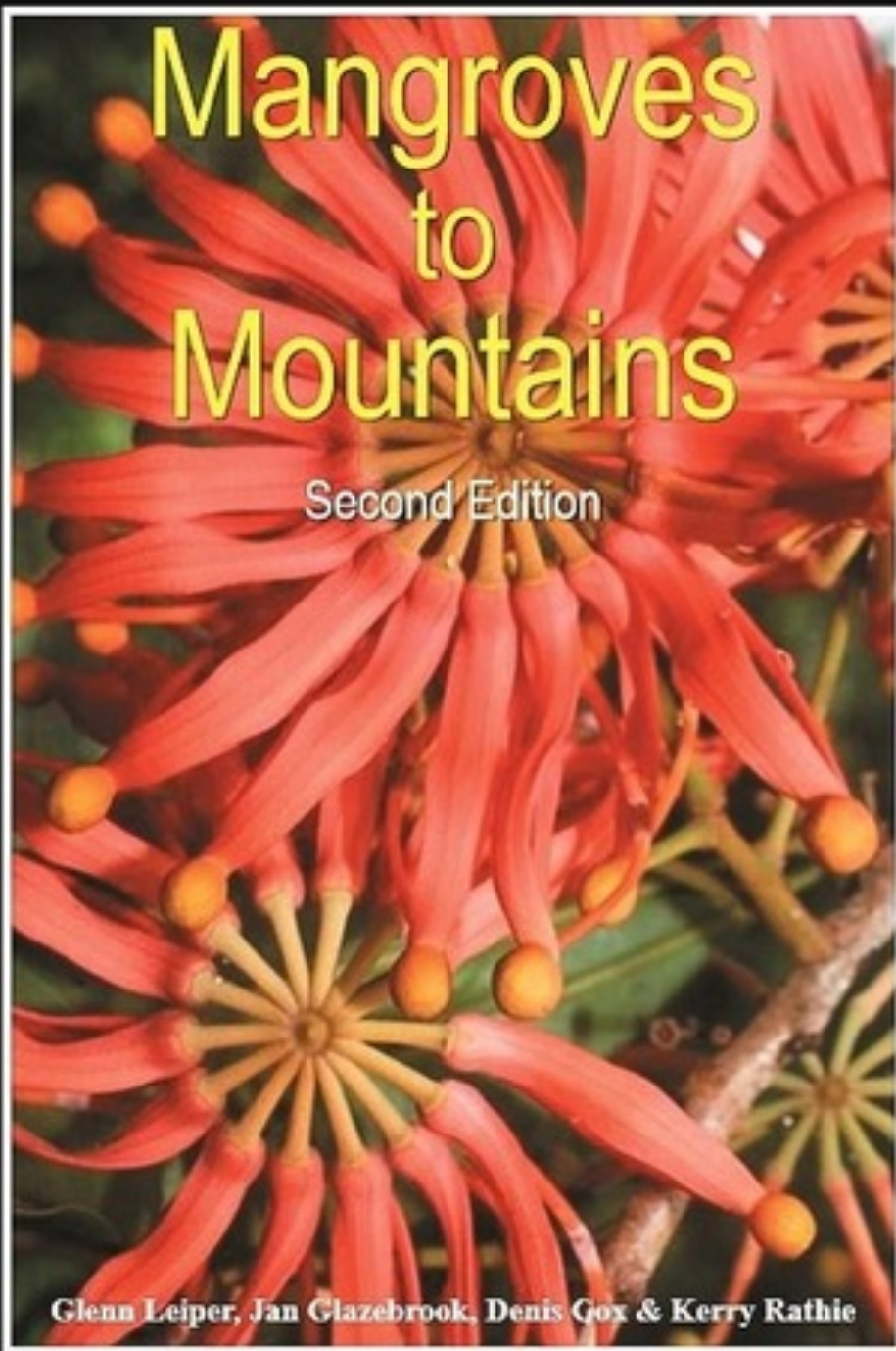
Australian Rainforest Plants volumes I – VI

Nan & Hugh Nicholson, Terania Rainforest Publishing, 1994/2003

www.rainforestpublishing.com.au/publications/

Available: BCC Mt Coot-tha Library (Botanical Gardens)
Botany Reference Section. Books II, IV, V.





www.mangrovestomountains.com/

INFORMATION SOURCES #5

Mangroves to Mountains

- Glenn Leiper, Denis Cox, Jan Glazebrook and Kerry Rathie, native plant enthusiasts, bushwalkers, and members of the Logan River Branch of the Society for Growing Australian Plants (SGAP)
- 576-page full colour field guide for identifying the native plants of south-east Queensland and northern NSW
- 2450 species of plants catalogued, most with colour photos.
- 3 Stinging trees included – Mulberry leaf, excelsa and shining leaf

CRONIN'S KEY GUIDE

Australian Trees



Leonard Cronin

INFORMATION SOURCES #6

Cronin's Key Guide to Australian Trees

Leonard Cronin

Three species - pages 121-122

Allen & Unwin 2007

Copy held in the BBW Library

Cronin contributes a monthly column about Australian wildlife to the ABC's Gardening Australia magazine.

INFORMATION SOURCES #7

- **Wikipedia:** *Dendrocnide moroidies*
- **Wikipedia:** *Dendrocnide photinophylla*
- **Wikipedia:** *Dendrocnide excelsa*
- **Wikipedia:** *Dendrocnide cordifolia*

part 1

STINGING TREE BOTANY

FAMILY AND SPECIES

'Out of 250,000 plant and fungi species in Australia about 2000 are toxic to animals and humans...'
Ross McKenzie.

URTICACEAE (family)

(SPECIES)

Dendrocnide
(stinging trees)
Previously *Laportea*

Urtica urens
Urtica incisa
(stinging nettles)

Dendrocnide... from the Ancient Greek *dendros* (tree) and *knide* (nettle), thus 'tree nettle'.

Note: technical accuracy not guaranteed.

DENDROCNIDE SPECIES

- **Gympie/Mulberry leaf Stinger** – *Dendrocnide moroidies* up to 4-5 m
- **Giant Stinging Tree** – *Dendrocnide excelsa* up to 35 meters
- **Shiny leaf Stinging Tree** – *Dendrocnide photinophylla* up to 20 meters
- **Atherton Tableland Stinger** – *Dendrocnide cordata (cordifolia)* up to 4m

(also a fifth species, *D. corallodesme*, the Mango-leaved stinger, found only in the far north eastern Cape York coastline)

DENDROCNIDE SPECIES

Anecdotal BBW experience suggests the Shining Leaf species might be more painful than the Giant stinging tree...

Scientific name	Common names	Habitat locations (coastal)	Evidence of toxicity	Degree of danger
D. moroides	Gympie, gympi-gympi, mulberry-leaf stinger	Far north & SEQ, mid/south NSW	●●●●	●●●
D. cordata	Gympie	Cairns, Atherton	○○	●●●
D. excelsa	Giant stinging tree	SEQ to NSW/ Vic border	○○	●●
D. photinophylla	Shining leaf stinging tree, gympi-gympi,	Far north & SEQ, mid-NSW	○○	●
D. corallodesme	Mango-leaved stinger	Cape York	○○	●

Source: *Australia's Poisonous Plants...* Ross Mackenzie 2012, page 813, also pages 637-643

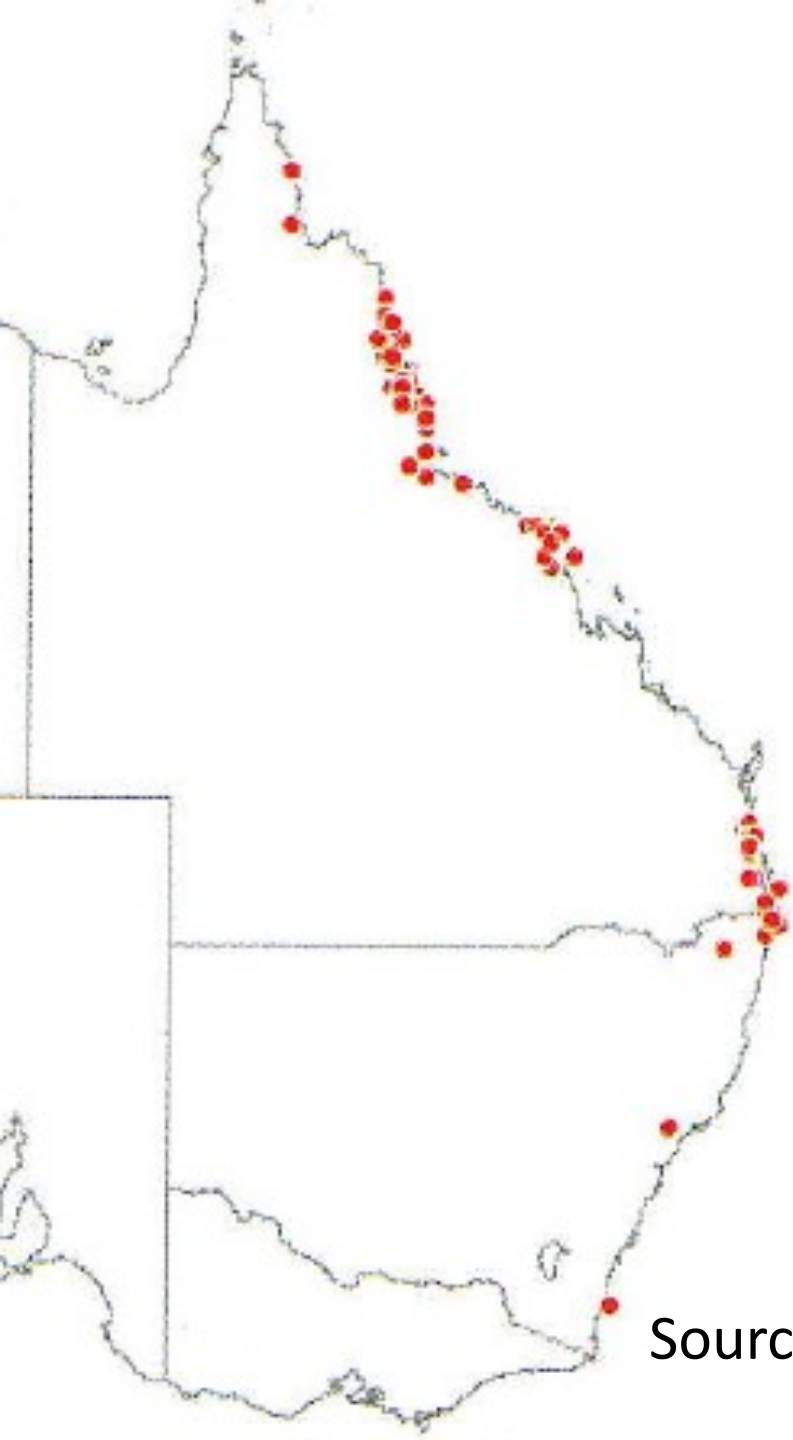


Moroides = mulberry-resemblance

MULBERRY-LIKE GYMPIE BUSH

Dendrocnide moroides

- Most commonly known (and most painful) species
- Shrub or small tree to 4-5m height, also young plants to 50 cm ('ankle biters')
- First named "gympie-gympie bush" by gold miners near the town of Gympie in the 1860s.
- Also named the 'mulberry leaf' stinger
- Note the 'felty' aspect to the leaves (due to the mass of stinging hairs) and the serrated edges to the leaves.
- Venation is quite distinctive.



MULBERRY-LIKE GYMPIE BUSH

Dendrocnide moroides

Young leaf and flowers...
McKenzie 2012 p.639



Source: McKenzie 2012 p.641

Dendrocnide moroides – flowers and young leaf



GIANT STINGING TREE

Dendrocnide excelsa

- Commonly known as the giant stinging tree or fibrewood.
- Occurs from Tathra, New South Wales to Imbil in south-eastern Queensland,
- Very common at Dorrigo National Park (1hr from Coffs Harbour), and other rainforest walks in eastern Australia.
- Habitat: subtropical, warm temperate or littoral rainforest, particularly in disturbed areas, previously flattened by storms or cyclones.

GIANT STINGING TREE

Dendrocnide excelsa

Young leaf:

McKenzie 2012 p.640



Dendrocnide excelsa – young leaf

Source: McKenzie 2012 p.641



Older *D. photinophylla* with the **mature-form** glossy leaves with stinging hairs restricted primarily to the leaf veins. Wikipedia

SHINING LEAF

Wikipedia: *Dendrocnide photinophylla*

- Shining-leaved stinging tree, rainforest tree of eastern Australia.
- occurs from near the Colo River northwest of Sydney to Cooktown in tropical Queensland
- Versatile species, it occurs in many different rainforest types.
- *photinophylla* translates to shining leaf



D. photinophylla **seedling** with pronounced stinging hairs on the upper surface of the leaf (and serrated edges): Wikipedia

SHINING LEAF

Dendrocnide photinophylla
(the shiny-leaf stinging tree)



Edges serrated !!

Edges not serrated !!

SHINING LEAF

Dendrocnide photinophylla

Flowers and leaves...
McKenzie 2012 p.639



Dendrocnide photinophylla – flowers and leaves



Source: McKenzie 2012 p.641

CORDATA STINGING TREE



Young plant

Dendrocnide cordata/cordifolia

- Also commonly known as the stinging tree, endemic to the Atherton Tablelands, southwest of Cairns, Queensland.
- Contact with the plant (like the others in the family) results in a painful sting, however the intensity and duration of the pain from this plant is extreme.
 - (contradicts McKenzie 2012 table p.813)

CORDATA (Continued)

Dendrocnide cordata/ cordilfolia

- Common names for this plant are similar to *D. moroides*, (Gympie Stinger), as this plant is often confused with *D. moroides*.
- Grows up to 4m tall
- Found on the Atherton Tablelands, in New Guinea and Torres Strait islands.
- Shrub similar in habit to *Dendrocnide moroides* with heart shape leaves but with a broad notch at the base in which is inserted the leaf stalk.
- Local experience on the Atherton Tablelands indicates that it's probably just as bad an irritant as *D. moroides*

MATURE PLANT
Photo?



D. CORDATA

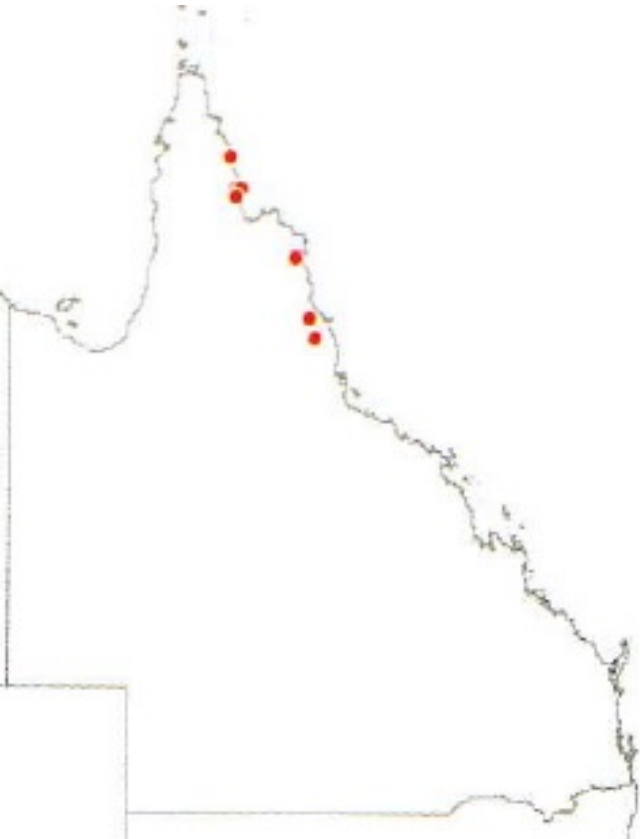
Dendrocnide cordata/cordifolia

Source: McKenzie 2012 p.641

THE FIFTH: *D. CORALLODESME*

Dendrocnide coralloidesme

See Mckenzie 2012: page 641-2



Photo?

RECOGNITION SUMMARY

Names	Mature height/ diameter	Leaves	Flowers (fruit)
Mulberry leaf stinging tree (D. moroides)	Small tree or shrub to 4-5m... Diameter n/a	Alternate, broad-ovate, regularly saw-toothed margins, hairs top & underside, 6-30cm long. Strong venation, especially for immature plants. <u>Peltate stalk attachment.</u>	Yellowish-green clusters (fruit mulberry pink-purple)
Giant stinging tree (D. exclesa)	To 50m... 2m dia with full-height vertical flutes	Alternate, broad-ovate, to heart-shaped with toothed margins, downy hairs top & dense rigid hairs underside, 10-30cm long	Yellowish-green clusters (fruit small black warty)
Shining leaf stinging tree (D. photinophylla)	To 30m... 75m dia	Alternate, broad-ovate to elliptical, entire or irregularly fine-serrated edges, smooth/glossy on top, 5-15cm long. <i>Immature plants:</i> stronger edge serration, less smooth? Leaves maybe darker green than the others.	Yellowish-green clusters (very small flattened whitish)

Source: Cronin 2013 and McKenzie 2012 p.638: For GLOSSARY see next slide...

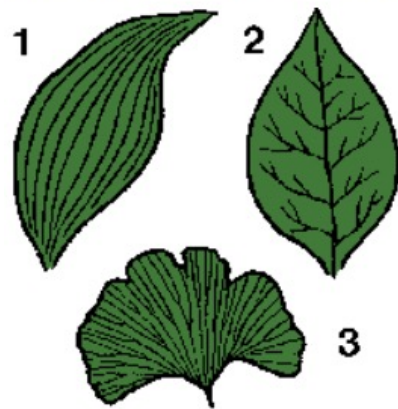
GLOSSARY

Ovate leaf shape : having an outline like a longitudinal section of an egg with the basal end broader

Venation : an arrangement or system of veins (as in the tissue of a leaf or the wing of an insect)

Peltate: having the stem or stalk attached to the lower surface of the leaf instead of at the base or margin.

Illustration of venation



1 parallel-veined,
2 net-veined,
3 dichotomously veined

Peltate attachment of stalks to underneath (like an umbrella)



part 1a

SIMILAR SMALL TREES AND SHRUBS



Macaranga

MACARANGA

Macaranga tanaris

- Australian native also known as the ***Blush macaranga*** and ***Parasol leaf tree***
- Tall shrub or small bushy tree, straight upright sapling/trunk
- Leaves broad ovate, heart-shaped, alternate, and attachment underneath (hence *Parasol* common name)
- Leaves can be bluish green colour
- Leaves not eaten by insects as much as *D. Excelsa* leaves

D. Excelsa



References:

Leonard Cronin 2007/2013 page 41

Wikipedia: *Macaranga tanaris*



The leaves turn red when senescent, hence the common name of bleeding heart.

BLEEDING HEART NATIVE POPLAR

***Euphorbiaceae Omalanthus nutans* (Cronin)**

***Homalanthus populifolius* (Wikipedia)**

- Australian rainforest plant, often appears in areas of rainforest disturbance.
- Use as a pioneer species in rainforest regeneration.
- Small tree or shrub, up to 8 meters tall and 15 cm in diameter.
- The trunk is cylindrical with greyish-brown bark, fairly smooth but with some bumps and irregularities.
- Branchlets appear thick, reddish or green.
- The leaves are triangular, not toothed and alternate, 5 to 15 cm long, and like those of a poplar

References:

Leonard Cronin 2007/2013 page 42

Wikipedia: *Homalanthus populifolius*



*BCC Weed
Identification*



Wikipedia

WILD TOBACCO PLANT

Solanum mauritianum (BCC & Wikipedia)

- A large shrub or small tree usually growing 1.5-4 m tall
- Large leaves have entire margins and densely hairy undersides
- One or two ear-shaped leafy structures are usually present at the base of the leaf stalks.
- Mauve or purple star-shaped flowers are produced in dense branched clusters.
- Fruit are yellow globular berries (10-15 mm across)
- Native to South America – environmental weed

References:

Brisbane City Council:

<https://weeds.brisbane.qld.gov.au/weeds/wild-tobacco-tree>

Wikipedia: *Solanum mauritianum*



*BCC Weed
Identification*

LANTANA

Lantana camara

- rough-textured and usually prickly shrub with oppositely arranged leaves.
- dense flower clusters consist of numerous small tubular flowers (9-14 mm long and 4-10 mm across)
- could be mistaken for the terrible *D. moroides* perhaps (or vice versa)?

References:

Brisbane City Council:

<https://weeds.brisbane.qld.gov.au/weeds/lantana>

part 2

REACTIONS TO CONTACT WITH STINGING TREES

BEWARE STINGING TREE

VISITORS ARE ADVISED TO BEWARE OF THE STINGING TREE. CONTACT CAN CAUSE SEVERE PAIN AND DISTRESS. IF STUNG - SEEK IMMEDIATE MEDICAL ATTENTION DIAL 000



危険 スティングツリーにご注意！
この辺りには、スティングツリーがございます。
トゲに刺されると激痛を引き起こしますので
ご注意ください。万一、刺された場合は直ぐに
治療を受けてください。
救急電話番号 **000**

REACTIONS - MILD

“ Since relocating from Melbourne to Brisbane in 2008, I have had several brushes with stinging trees in South-East Queensland and the Northern Rivers on arms, thighs, legs and hands while walking through rain forest, along creeks or just finding a spot to sit for lunch.

In each case I washed the area immediately with water, and 90 percent of the sting was gone in a few hours. Was I just lucky?”

Last three encounters (*D. excelsa*):

- England Creek, Right Branch, D’Aguilar National Park
- Love Creek above the falls, D’Aguilar National Park
- Brummies Lookout, Wollumbin National Park (Mt Warning)

Paul Hinkley, BBW Leader

REACTIONS – SEVERE – BBW INCIDENT #1

“Fortunately (relatively) I encountered the less virulent *Dendrocnide photinophylla* or the shiny-leaf stinging tree. Because it doesn't look like Gympie Gympie, I thought it was harmless.

It was approximately 60cm high and positioned in the middle of a rough track [along Enoggera Creek]. I felt the sting from knee to ankle of both legs seconds after I brushed past the tree.

After attempting to remove its fine hairs with tape we continued to the end of the walk which felt like an hour, during which time a distressing level of pain came in waves. The distraction of walking helped. Once I was in a car though, it was excruciating and impossible to sit still. I alerted Rob by telephone and he found a remedy here:

<http://c-foam.com.au/wp-content/uploads/2018/04/ARCS-Tox-Stinging-Tree-Management.pdf>

CONTINUED...

REACTIONS – SEVERE – BBW INCIDENT #1 (Cont'd)

“ We followed the remedy to the letter and yes, it felt worse than the initial condition for a time (picture uncontrolled wailing in the front yard of a house on a busy suburban road).

It took three doses of Panadeine Forte over the course of the afternoon to settle the pain. I was able to sleep and the next day, all that remained was a prickling, tingling sensation. I've attached a photo of the *waxeeze* stage of the remedy.

So, not as painful as other varieties we see, but still quite awful.”

Linda McPhee, BBW Member
(permission granted)



Walk details: www.brisbanebushwalkers.org.au/activity/2021-10-20/enoggera-ck-jollys-ck

REACTIONS – SEVERE – BBW INCIDENT #2

“ I grabbed hold of a stinging tree trunk, no leaves [to avoid sliding down the slope]. Very exciting day. We used tape to pull out the hairs that we could and from there nothing made a difference. Went to Prince Charles Outpatients due to pain and extreme swelling.

I could not sit and wait so went round to private emergency, nurse came out and said may be a little while, then came back and said ‘you are coming in now’. Got saline and antihistamine drips and endone tablets [strong prescription pain medication]. Swelling and pain did not really subside for a few hours and the doc told me to stay until I could properly bend fingers.

About 80 percent good by next day but still lingering effects around knuckle joints. BTW the doctor, actually a professor of emergency medicine, told me he would not have taken the path they took at Prince Charles as if really unlucky these stings can lead to shock (which I had), and cardiac arrest. Moral of the story -- wear good solid gloves in any likely place!

Leonie Kneeves, BBW non-active Member, currently in the UK (permission granted)

Walk details: Mountford Creek, Bellthorpe National Park, 20 November 2021

www.brisbanebushwalkers.org.au/activity/2021-11-20/mountford-ck-bellthorpe-national-park

REACTIONS – SEVERE – BBW INCIDENT #3



I brushed the dorsal thumb and lateral edge and second knuckle of the first finger against a leaf as I was pushing foliage out of the way as we walked along a creek bank. It immediately felt like a shock and I jerked my hand away with a yell. After a few moments more, a burning pain appeared, intensifying over perhaps 10 seconds.

After about 2 minutes I got to a place where we could stop and I applied Stingose gel thickly, which seemed to reduce the intensity of the burning sensation, but the sensation was still strong around the edges of my fingernail, even when I tried to direct more gel onto that area. I didn't want to rub it in more firmly because I was very keen to avoid transferring any stinging hairs to the other hand!

The burning subsided further after another 5-10 minutes, but I was also distracted by traversing very slippery terrain, followed by discovering that one of our party had a leech in his eye (type II fun day for sure.)

CONTINUED

REACTIONS – SEVERE – BBW INCIDENT #3 (contd)



It didn't feel like there was anything wrong with my grip, but I dropped my walking pole from the right hand several times on the return walk, even when we were back on the track. I don't recall any stabbing sensations but the burning sensation returned at intervals during the rest of the walk and drive back to Brisbane, a period of about 6 hours.

However it was gradually reducing and by the time I washed my hands in Brisbane, submerging my hands caused a hot but not painful sensation. The following day it felt mildly warm whenever I washed my hands and after that day there were no more unusual sensations at the site.

There had been very heavy rain the previous day and the morning of the walk, so possibly some stinging hairs had been washed away, or possibly it was just because I had only a glancing contact.

Katie Lee, BBW Leader (permission granted)

Walk details: October 2021, Christmas Creek, Lamington National Park.

REACTIONS – SEVERE – BBW INCIDENT #4



Over the years I have been stung by low-height stinging trees multiple times on my legs, forearms and face while walking water courses – Albert River as part of the Lost World circuit, and Black Canyon are particularly memorable.

I have found the gel from the base of the cunjevoi plant stems to be soothing. I apply it in the opposite direction to that of the contact. But the stinging after-effect (on both elbows) has lasted for the long term with the affected skin areas becoming itchy, especially during the warmer months.

On the basis of my own and other's experiences, I wonder if the strong reactions that some people report having that are similar to anaphylaxis might be related to the person's reaction to allergies and thus these people would best be prepared for such an emergency by wearing full coverage and carrying doctor-recommended remedies.

Neil Parker, BBW Leader (permission granted)

REACTIONS – SEVERE – BBW INCIDENT #5a & b

“ On a steep bank of Love Creek, I grabbed hold of a tree stem sapling to steady myself and then realised it was a stinging tree. I slipped down to the creek and held my right hand in the cold creek water.

I used my Stingose spray on the three affected fingers. Stopped the pain, but I was not able to use these fingers for scrambling for the rest of the day.

Next day my fingers were back to normal.

“ On our way to Duck Creek Falls (Lamington National Park) a walker brushed her arm against a stinging tree. I offered her my Stingose, and soon she was fine.

Marion Archibald, BBW Leader (permission granted)

REACTIONS – SEVERE – BBW INCIDENT #5c



On a walk of Box Tree Circuit (at Cunningham's Gap) last January, my 12-year old grandson wanted to cross the creek using a fallen tree trunk. Despite my warning, he brushed a young stinging tree amongst the thick vegetation with his arm and thigh (4 areas).

He was screaming in pain. I spread Stingose gel on affected areas but he was still in pain. He had small welts coming up on his arm with a stinging hair in each. I used plaster strips to remove the hairs.

I gave him two Ibuprofen tablets for the pain and he slept in the car on the way home. He was totally fine by the time we arrived home and he had a shower to wash off the white Stingose. His skin was back to normal.

Marion Archibald, BBW Leader (permission granted)

REACTIONS – SEVERE – BBW INCIDENTS #6



North Queensland:

- Up Garrawalt Falls to Wallaman Falls (northern Queensland)
- Descending to the creek, most of the party got stung, Peter, the leader rolled into a Gympie. The stings stayed with us for nearly 6 weeks. NQ Gympie is awful, SEQ Gympie so much milder.

SEQ:

- There is a patch of the dark leaf stinging bush below one of the falls in the upper part of Northbrook Creek probably about 200m below the top. A member of our party was stung through her long pants on the thigh. We used strapping tape to pull out the silica spicules. There is a lot of the large leaf stinging tree in that part of the creek.
- We have seen this dark leaf stinger is in the creek below Watson's Falls.

Marion Darveniza (permission granted)

REACTIONS – EXCRUCIATING



**‘The worst kind of pain you can imagine’ –
what it’s like to be stung by a stinging tree**

September 28, 2018 2.49pm AEST

MARINA HURLEY

<https://theconversation.com/the-worst-kind-of-pain-you-can-imagine-what-its-like-to-be-stung-by-a-stinging-tree-103220>

REACTIONS – EXCRUCIATING

“ He’s had too many stings to count but **Ernie Rider** will never forget the day in 1963 that he was slapped in the face, arms and chest by a stinging tree.

“I remember it feeling like there were giant hands trying to squash my chest,” he said.

“For two or three days the pain was almost unbearable; I couldn’t work or sleep, then it was pretty bad pain for another fortnight or so. The stinging persisted for two years and recurred every time I had a cold shower.”

Now a senior conservation officer with the Queensland Parks and Wildlife Service, Ernie said he’s not experienced anything like the pain during 44 years work in the bush.

“There’s nothing to rival it; it’s 10 times worse than anything else – scrub ticks, scrub itch and itchy-jack sting included. Stinging trees are a real and present danger.”

AMANDA BURDON Australian Geographic June 16, 2009

www.australiangeographic.com.au/topics/science-environment/2009/06/gympie-gympie-once-stung-never-forgotten/

REACTIONS – EXCRUCIATING



So swollen was **Les Moore** after being stung across the face several years ago that he said he resembled Mr Potato Head.

“I think I went into anaphylactic shock and it took days for my sight to recover,” said Les, a scientific officer with the CSIRO Division of Wildlife and Ecology in Queensland, who was near Bartle Frere (North Peak) studying cassowaries when disaster struck.

“Within minutes the initial stinging and burning intensified and the pain in my eyes was like someone had poured acid on them. My mouth and tongue swelled up so much that I had trouble breathing. It was debilitating and I had to blunder my way out of the bush.”

AMANDA BURDON Australian Geographic June 16, 2009

www.australiangeographic.com.au/topics/science-environment/2009/06/gympie-gympie-once-stung-never-forgotten/

REACTIONS – INHALATION

“ Early 2010s, Yerralahla track, mid afternoon. We walked through a grove of giant stinging trees on a very warm, still afternoon and the air in the clearing was hazy - I think with detached stinging hairs.

A few minutes later I began to have severe hay-fever symptoms including running nose, itching eyes and headache. We had some antihistamines in the first aid kit so I took 2 of those and had to lie down beside the pool at the bottom of the track for half an hour before I was able to go back up the track. There was no return of symptoms after passing through the grove on the return leg.

Katie Lee, BBW Leader (permission granted)

Walk details: West Canungra Track, Lamington National Park

REACTIONS – INHALATION

NOTE documentation of inhalation reactions:

'Intense irritation of the throat and irritation of the nose causing prolonged violent sneezing can follow breathing in of fine air-borne material from stinging trees in windy conditions or if the plants are being cleared during forestry operations.'

Ross McMenzie 2012, page 642

part 3

CONTACT SYMPTOMS

SEVERE SYMPTOMS

- First sensation following contact is a slight itch
- In less than 60 seconds, an intense and persistent pain at the site of contact with stinging hairs
- After 5 minutes, local sweating, erection of skin hairs ('goose-bumps') and reddening at the sting site (may continue to after 10 hours)
- Pain may be felt in the armpit or groin, depending on the location of the sting and elsewhere in the body.
- Within 5-10 minutes stung area quickly becomes covered with 1 mm diameter red spots that fuse to form a zone of swelling and reddening. May persists for 8 hours or more.
- Some sweating persists for up to 30 hours
- Severe stinging may cause pain so intense that it causes periods of unconsciousness.

Australia's Poisonous Plants... Ross McKenzie 2012: page 642

SEVERE SYMPTOMS (Continued)

- Pain sensation is complex. It is composed of a background of tingling on which is superimposed an intermittent stabbing pain, with sharp radiations passing in all directions. After as short a time as 10 minutes with severe stings, the stabs of sharper pain decrease in intensity and in frequency, while the back-ground increases to a diffuse pain.
- *D. excelsa* and *D. photinophylla* — pain lasts for about 24 hours.
- *D. moroides*, *D. cordata* and *D. corallodesme* — pain may persist for several weeks, and then return for months after that if the affected site is rubbed, washed with water or exposed to cold, including cold weather...
- Intense irritation of the throat and irritation of the nose causing prolonged violent sneezing can follow breathing in of **fine air-borne material from stinging trees in windy conditions** or if the plants are being cleared during forestry operations

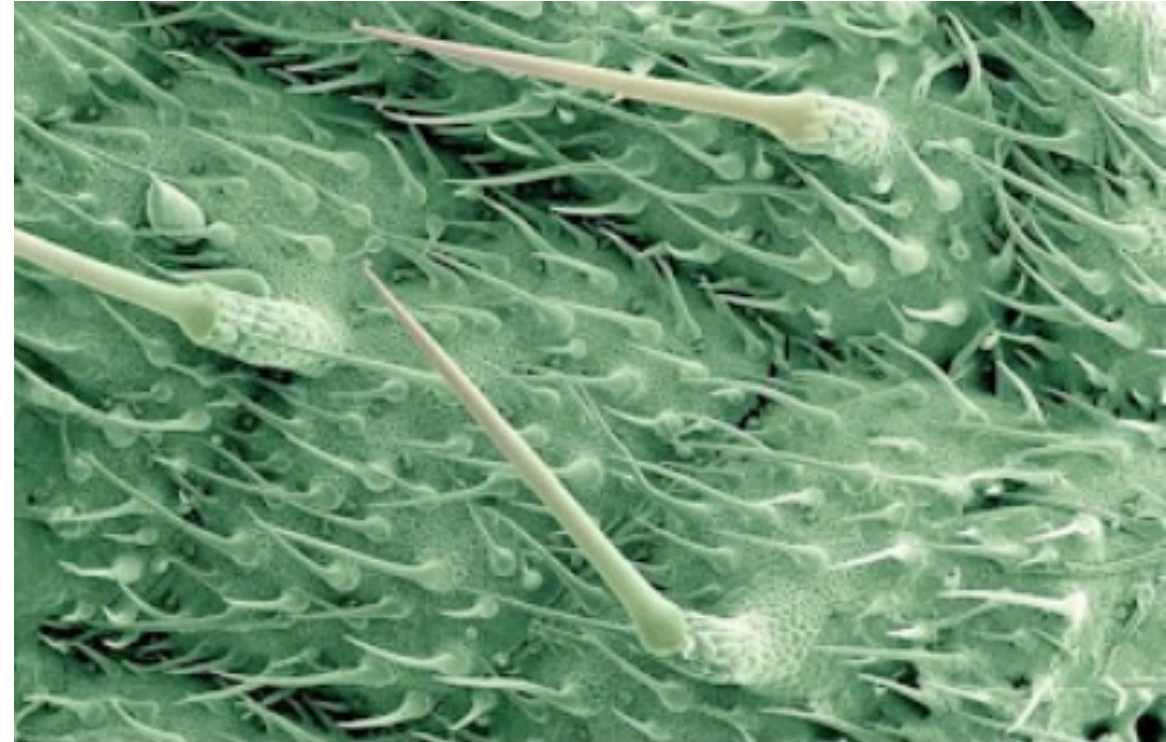
Australia's Poisonous Plants... Ross McKenzie 2012: page 642

part 4

STINGING MECHANISM

STINGING MECHANISM

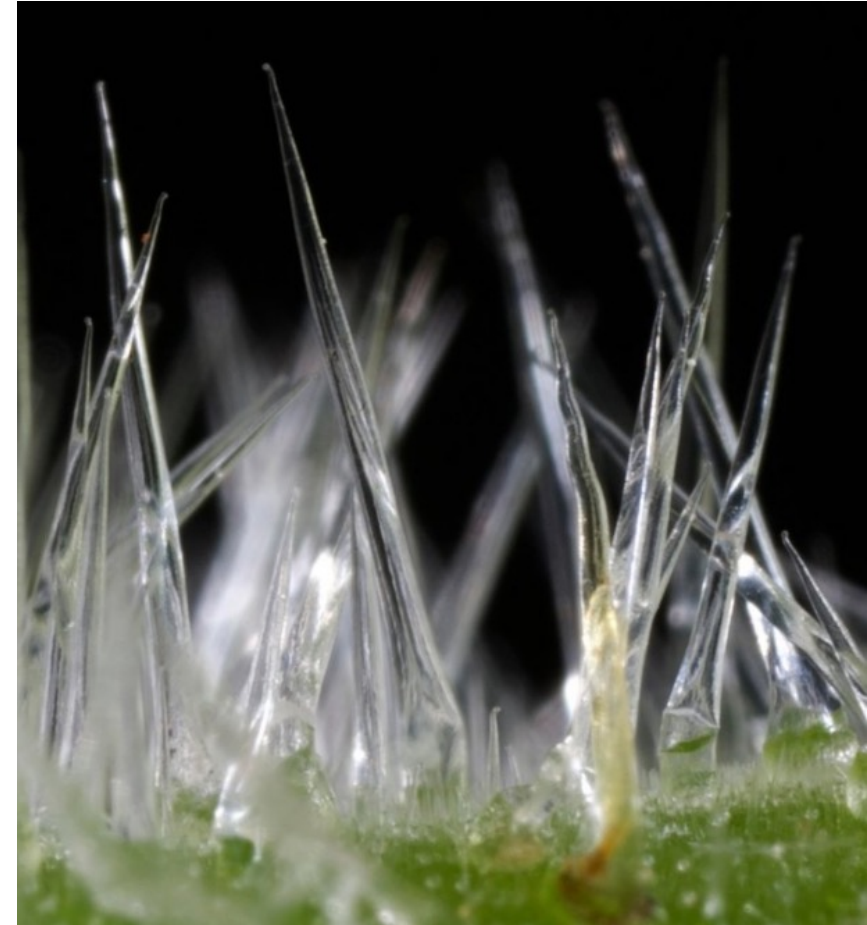
- All four [five] types of stinging trees have a similar stinging mechanism.
- Severity of the sting depends on the surface area of skin making contact with the leaf, the number of hairs on that leaf and the nature of the poison contained in the hairs.
- Venom is contained within tubular silica hairs functioning as self-injecting hypodermic syringes after the tip breaks off on contact with the skin.



Source text & photo: CTRS Blog

STINGING MECHANISM

- On a large *D. moroides* leaf 30 cm by 20 cm there can be as many as 15,000 hairs on both sides of a single leaf.



Source text: CTRS Blog
Photo: Wikipedia

REASONS FOR DIFFERENT REACTIONS?



Facebook

Suggested by Hugh Spencer of CTRS:

- Different idiosyncratic reactions
- Different degree of encounter/entanglement with the stinging tree
- Toughness of the affected skin (controls the penetration of the little spines)
- Variety of stinging tree -- *D. excelsa* is lot weaker whereas *D. moroides* & *cordata* are very mean and nasty
- Anaphylactic response not likely (contradicted by HealthDirect online advice)

HS/PH Email 18 February 2022

part 5

TOXICOLOGY

TOXINS

The cocktail of toxins:

- Can be present and active in fallen and dead leaves
- Have been known to last for years in laboratory specimens

Note difference from:

- *Stinging nettle* – oxalic, tartaric acid, or nitrates?
- *Ant bite* – formic acid

Source: CTRS Blog: accessed Feb 2022

Stinging nettle



THE TOXINS – 1957 UQ RESEARCH

Robertson PA & MacFarlane WV (1957)

*Pain-producing substances from the stinging bush *Laportea moroides*.*

Australian Journal of Experimental Biology and Medical Science

Volume 35 pages 381-394.

Department of Physiology and Pharmacology, University of Queensland

THE TOXINS – 1957 UQ RESEARCH

SUMMARY.

Extracts of the stinging hairs of the Gympie bush (*Laportea moroides*) have been found to contain 0·01-0·025 μg . acetylcholine-like activity, 0·025-0·05 μg . histamine-like, and 0·001 μg . 5-hydroxytryptamine-like activity per hair.

Intradermal injection of dialysed extract, free of acetylcholine, histamine and 5-hydroxytryptamine, causes the characteristic intense pain, flare, piloerection and local sweating of a *Laportea* sting.

Specific blockade of the action of acetylcholine, histamine and 5-hydroxytryptamine did not prevent the production of nettle pain.

A stable, non-dialysable substance, resistant to heat, neutral in reaction, unattacked by proteolytic enzymes appears to be the essential pain-producing material. It also induces sweating, piloerection and arteriolar dilatation.

THE TOXINS – VERSION 1

The cocktail of toxins:

- *Acetylcholine* (Ach) has a parasympathetic **stimulant** effect causing vasodilation of blood vessels in the skin and sweating.
- ***Histamine*** dilates the capillaries and increases capillary permeability leading to edema, erythema, and weals.
- *Hydroxytryptamine* (5-HT) serotonin neurotransmitter involved in **pain production and vasoconstriction**.
- *Neuropeptides*, short chain **proteins**, probably causes the **long term pain**, hyperalgesia and sensitivity to temperature.
- *Bradykinin, SRA, Leukotrienes* and others.

Source: Cape Tribulation Research Station Blog, March 2022

THE TOXINS – VERSION 2

Toxins:

- Pain-producing toxins are injected through the skin by hollow plant hairs.
- **Moroidin**, a pain-producing bicyclic octapeptide, has been identified in the stinging hairs of *D. moroides*.
- The leaves of this species contain 20-24 mg moroidin per kg fresh weight...
- The mechanism by which moroidin produces pain is not known.

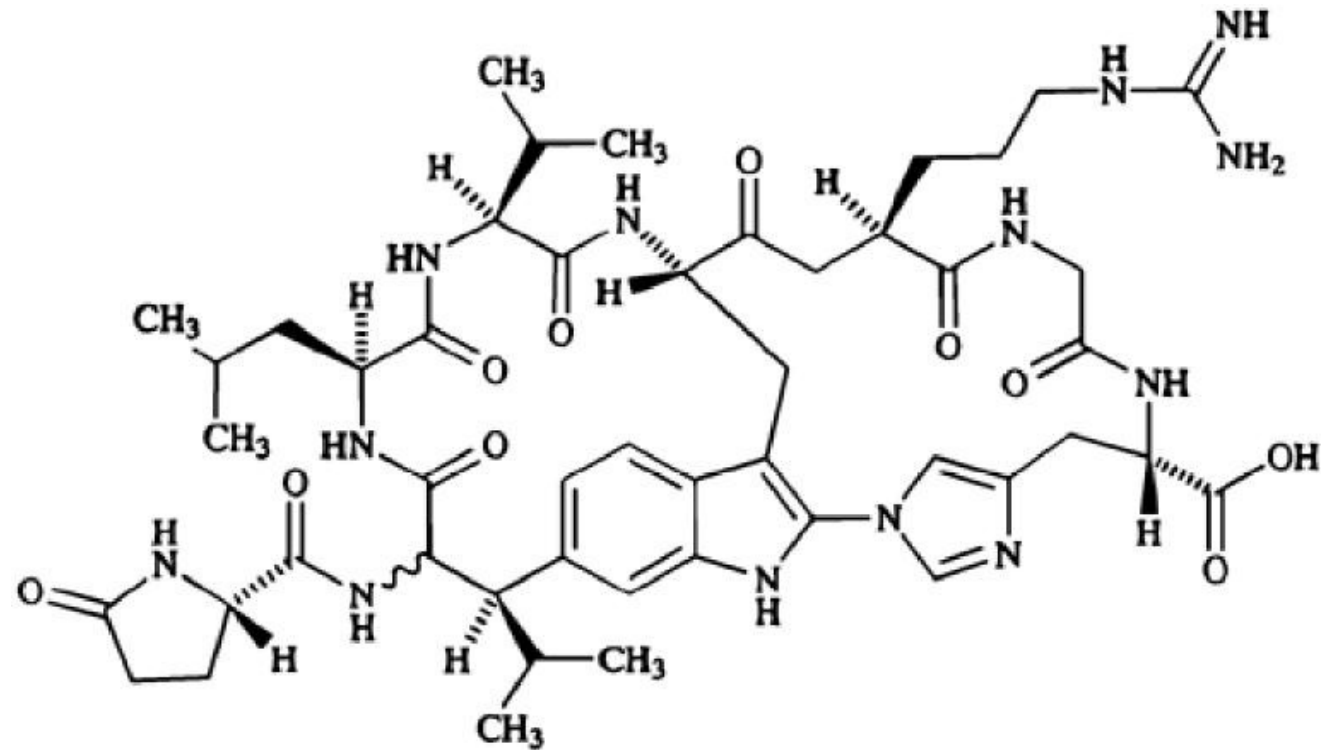
Source: Australia's Poisonous Plants..., Ross McKenzie 2012, page 643

THE TOXINS – VERSION 2a

Moroidin from *Dendrocnide moroides* stinging hairs
[Kahn *et al.* 1989; figure from
Harborne & Baxter 1996]

Source: McKenzie RA (*ca.* 2010)
*Toxicology for Australian
Veterinarians*. 2nd edition
(unpublished).

BUT SEE 2020 RESEARCH PAPER!!



THE TOXINS – VERSION 3

Dr Irina Vetter, Institute of Molecular Biology, University of Queensland:

- “The main pain causing principle is **toxins that activate sodium channels**. Unfortunately there probably isn’t terribly much you can do – maybe a local anaesthetic cream would do the trick (as they block sodium channels).
- I haven’t gone out of my way to prove it but I think the myth that **wax strips** help remove leftover hairs is probably totally wrong, the hairs actually only break off right at the tip and they are too small to feel going in (plus other plants with similar hairs, like cucumbers, don’t cause pain anywhere close)
- I also really don’t think that **dilute hydrochloric acid** would work, the peptide is an inhibitory cystine knot and likely to be extremely stable. You’re more likely to denature other proteins in your skin before you denature the peptide...

CONTINUED

THE TOXINS – VERSION 3

FROM PREVIOUS SLIDE...

- Personally I find appreciating how the toxin makes your sensory neurons “sing” is the best way to tolerate the pain. For most casual encounters it’s not dangerous, and while cold *allodynia* can last a long time, it’s also more annoying than dangerous.
- Maybe one day we can convert the toxins to blockers and then you’ll have very long-lasting analgesics...
- I haven’t tested any of the other things people have told me over the years. But basically, you get spontaneous action potential firing (and hence pain) because the toxin stops voltage-gated sodium channels from closing. So **anything that stops nerve endings from firing (local anaesthetics) would work.”**

Source: Email Dr Irina Vetter to Katie Lee, 27 March 2022

[*Allodynia* is extreme sensitivity to touch, pain due to a stimulus that does not normally provoke pain.]

THE TOXINS – RECENT RESEARCH- 2020

Institute for Molecular Bioscience, The University of Queensland

Gilding EK, Jami S, Deuis JR, Israel MR, Harvey PJ, Poth AG, Rehm FBH, Stow JL, Robinson SD, Yap K, Brown DL, Hamilton BR, Andersson D, Craik DJ, Vetter I, Durek T. *Neurotoxic peptides from the venom of the giant Australian stinging tree*. *Sci Adv*. 2020 Sep 16;6(38): doi: 10.1126/sciadv.abb8828.

From the Abstract:

“Pharmacological activity has been attributed to small-molecule neurotransmitters and inflammatory mediators, but **these compounds alone cannot explain the observed sensory effects**.

We show here that the venoms of Australian Dendrocnide species contain **heretofore unknown pain-inducing peptides** that potently activate mouse sensory neurons and delay inactivation of voltage-gated sodium channels.

These neurotoxins localize specifically to the stinging hairs and are miniproteins of 4 kDa, whose 3D structure is stabilized in an inhibitory cystine knot motif, a **characteristic shared with neurotoxins found in spider and cone snail venoms**.”

THE TOXINS – RECENT RESEARCH - 2021

Nees-Institut für Biodiversität der
Pflanzen, Universität Bonn, Germany

Ensikat HJ, Wessely H, Engeser M, Weigend
M. Distribution, Ecology, *Chemistry and
Toxicology of Plant Stinging Hairs*. Toxins
(Basel). 2021 Feb 13;13(2):141. doi:
10.3390/toxins13020141

From the Abstract:

“Since the middle of the 20th century, neurotransmitters (acetylcholine, histamine, serotonin) have been repeatedly detected in stinging hairs of Urticaceae....

These substances can explain some of the physiological effects of stinging hairs, **but fail to completely explain neuropathic effects, pointing to some yet unidentified neurotoxin**. Inorganic ions (e.g., potassium) are detected in stinging hairs and could have synergistic effects.

Very recently, **ultrastable miniproteins dubbed "gympietides"** have been reported from two species of Dendrocnide, arguably the most violently stinging plant. Gympietides are shown to be highly neurotoxic, providing a convincing explanation for Dendrocnide toxicity.”

THE TOXINS – RECENT RESEARCH -2021

Ensikat et al 2021 ..
(continued)

“Peptides and proteins.—A striking discovery was the identification of the octapeptide **Moroidin** from the Australian gympie bush (*D. moroides*) by Robertson & MacFarlane (1957).

‘The molecular structure was confirmed by Kahn et al (2000), **but a direct link between this substance and the effect of Dendrocnide stinging hairs could neither be demonstrated by these authors nor any study since. Leung et al (1986) cast serious doubt the pain-producing activity of Moroidin.**’ (page 18)

BBW CLUB DISCLAIMER:

This is General Information only. It is not Medical Advice. If you believe you have been stung, seek medical advice and treatment from a Medical Practitioner or call '000'. Any self medication based on this or any other information is at your Own Risk. Do not accept advice or treatment from a BBW Leader or BBW Member – they are not qualified.

part 6

TREATMENTS -
FIRST-AID AND ONWARDS

TREATMENT- 1957 UQ RESEARCH

Robertson & MacFarlane (1957) tested the putative effects of a number of 'remedies' using a single-blind experimental design with 4 subjects to each test, control and test sting sites on opposite forearms and tap water as a placebo. Rubbing itself produced some temporary relief. No 'remedy' was successful.

Tested 'remedies':

- juice from *Alocasia brisbanensis* (cunjevoi) leaves, stem or root
- *Dendrocnide excelsa* bark
- *Bowenia spectabilis* (zamia 'fern') root
- saturated aqueous solution of picric acid
- saturated solution of sodium carbonate
- solution of ammonium hydroxide (partial relief obtained on 2 of 4 occasions used)
- adrenaline cream
- mepyramine cream

Source: McKenzie RA (ca. 2010)
Toxicology for Australian Veterinarians.
2nd edition (unpublished).

TREATMENT- 1957 UQ RESEARCH

Robertson & MacFarlane (1957) gives details of results of treatments on 4 subjects on pages 385-6 with a SUMMARY on page 392:

Extracts of the stinging hairs of the Gympie bush (*Laportea moroides*) have been found to contain 0·01-0·025 μg . acetylcholine-like activity, 0·025-0·05 μg . histamine-like, and 0·001 μg . 5-hydroxytryptamine-like activity per hair.

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Specific blockade of the action of acetylcholine, histamine and 5-hydroxytryptamine did not prevent the production of nettle pain.

A stable, non-dialysable substance, resistant to heat, neutral in reaction, unattacked by proteolytic enzymes appears to be the essential pain-producing material. It also induces sweating, piloerection and arteriolar dilatation.

Check with your doctor before use.

'FOLKLORE' TREATMENTS

Source: CTRS blog

Anecdotal comments from CTRS blog:

- Cunjevoi (*Alocasia brisbanensis*)
- Dettol
- Hot Water
- Paw Paw Ointment
- Xylocaine or Lignocaine Creams (see separate slide)
- Spirits of ammonia
- Urine
- Rubbing with bark from base of tree*
- rubbing with fine sand*

Cunjevoi at
base of large
stinging tree:
Wikipedia



*** Note rubbing can make the sting worse**

Check with your doctor before use.

TREATMENT EXPERIMENTS

Experiments found these to be ineffective:

- Applying juice of Cunjevoi (*Alocasia brisbanensis*)
- Rubbing with excelsa bark
- Cold water
- Baking soda

Experiments found these to be partially effective:

- Dettol (full strength)
- Ammonia
- Hot water, hot water bottle or other warmth
- Adrenaline or mepyramine creams

Source: McKenzie 2012, page 643

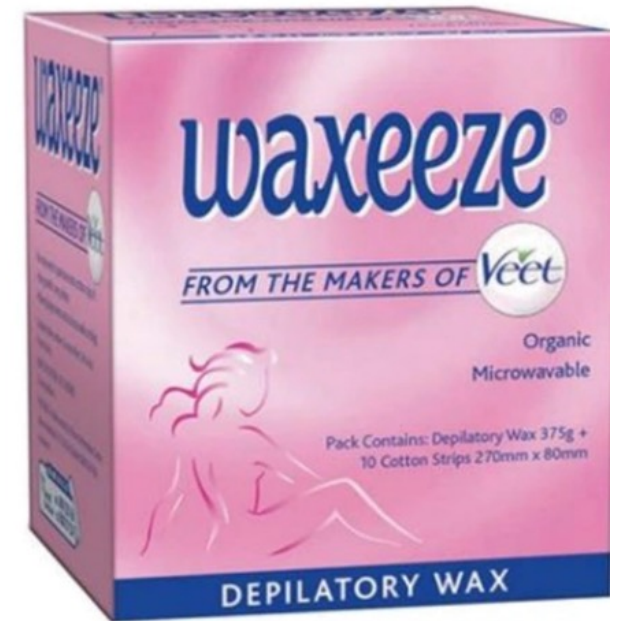


Check with your doctor before use.

DEPILATORY TREATMENTS

- The persistent nature of the sting is due to the silica hypodermic hairs remaining below the skin level until the body can physically repel them out of the skin -- this can take months.
- The use of depilatory wax although designed to remove human hairs is an effective method of removing stinging tree hairs.
- Treatment developed in the 1990's by Dr Hugh Spencer of the Australian Tropical Research Foundation (AUSTROP) and has since been used by many people including tour operators in tropical rainforest areas.
- Stings from all types of stinging trees are treated in the same manner.
- Recommended: "Waxeeze" a sugar-based depilatory (like very sticky toffee) readily available from most pharmacies, but any strip depilatory will do (see First Aid kit slide)

Note later mention of Nair strips...



Text source: CTRS blog

www.healthdirect.gov.au/stinging-plants

|| If you get stung follow this advice:

- the most important thing is that you do not rub the area, as this can break off the hairs and make them very difficult to remove
- remove visible hairs with tweezers
- apply and remove adhesive tape or hair-removal wax strip to the area to remove the finer hairs
- do not scratch or rub the area, this may cause the hairs to penetrate deeper into the skin

Check with your doctor before use.

OTHER ANECDOTAL TREATMENTS

Further anecdotal comment:

- Stingose**
- Vinegar
- Anti-histamine creams

** Note rubbing can make the sting worse – remove hairs first with tape and apply in opposite direction to contact



Check with your doctor before use.

ANALGESIC CREAM TREATMENTS



XYLOCAINE

- 5% Lidocaine (lignocaine) active ingredient
- Local anesthetic and pain relief
- \$26 for 15g (35g also available)
- www.xylocaine.com.au
- Shelf life 48 months if stored < 25 deg C

NUMIT

- 5% Lignocaine active ingredient
- Used for tattoo pain relief
- \$9.70 for 10g, \$30 for 30g



part 7

RISK MINIMISATION STRATEGIES

‘An gram of prevention is always worth more than a kilogram of cure’

PRECAUTION IS BETTER THAN CURE!

When in known stinging tree areas, in particular, the edge of rainforests, disturbed areas and creek beds...

- Wear hat, long-sleeve shirts and gloves
- Bush-bash through mixed scrub with caution
- Tread mindfully (including not social chatting)
- Alert those behind you if a hazard is close to the path
- Speak out to the leader if the pace is not respectful of potential hazards
- Take care if going off-track to answer a call of nature

ACKNOWLEDGMENTS

Thanks to those who have contributed to the project...

- Marina Hurley, PhD UNSW
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- Leonie Kneeves, BBW Member
- Mike O'Neill, BBW Leader
- Katie Lee, Molecular Biology PhD Candidate & BBW Leader
- Dr Irina Vetter, Institute of Molecular Bioscience UQ
- Dr Grant Cracknell, BBW Leader
- Neil Parker, BBW Leader
- Marion Archibald, BBW Leader
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