

# Growing Novel Crops in Cities – Dr Chris Williams Lecturer in Urban Agriculture, Burnley Campus, University of Melbourne

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Students hoeing crops  
c1894







Reconstructing the vegetable garden  
1918





# Cultivating field crops 1900







Individual plots in the 1950s – note the glass cloches





Vegetable  
garden in  
the 1980s





Hank Swaan and  
students working  
in a row of  
tomatoes  
1981



















# The Novel Crops Project

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- Identify 'new' food plants for cultivation in Melbourne gardens eg. Sweet Potato, Ginger etc in the context of climate change, cultural and linguistic diversity (CALD) (identifying 'culturally appropriate' food) and increased dietary choice
- Engage interest of designers, horticulturists, private gardeners, community groups, and local government through engagement projects and partnerships eg. City of Greater Dandenong, FareShare, United African Farm, FarmRaiser etc



# The Novel Crops Project (cont'd)

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- Trialling Australian species as 'staples' (not just condiments) eg. Warrine *Dioscorea hastifolia* etc
- Detailing propagation and cultivation requirements and tolerances (eg. Heat) and aesthetic value, for the Burnley Plant Guide (via student assignments and projects)
- Demonstration gardens in Burnley Field Station







My garden from 2011-2019 – before







... converted to food: annual and perennial vegetables and fruit trees









Have we really embraced the potential of Australia's cultural diversity and our location in the Asia-Pacific to think about the kind of food plants we grow?



# Sweet Potato

- *Ipomoea batatas* – Sweet Potato
- Family: Convolvulaceae
- Origin: Central America (not Peru as once thought)
- Perennial, creeping vine with compact forms available; 6000 varieties globally; excellent ground cover with many ornamental types; heat tolerant
- Starchy root tubers eaten with both “sweet” and “dry” forms; nutritious leaves also eaten cooked as a protein rich spinach
- Grows easily from cuttings or from slips induced on tubers
- Introduced to Asia and Africa by Europeans but already found in Polynesia, including New Zealand...how it got there remains a mystery





My first harvest of Beauregard Sweet Potato in autumn 2013, from my garden.

I have built a collection of 16 types, including ornamental varieties.



Finding new  
types to grow  
and busting  
Coles at the  
same time...

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January 25 2021



February 12 2021



















- [www.abc.net.au/news/rural/programs/landline/2017-07-05/sweet-dreams:-the-community-garden-growing-sweet/8670410](http://www.abc.net.au/news/rural/programs/landline/2017-07-05/sweet-dreams:-the-community-garden-growing-sweet/8670410)







Sweet Potato growing and distribution to FareShare and the Collingwood Children's Farm December 2023



## *Oxalis tuberosa* – **Oca** or **New Zealand Yam** (pp 83-92 *Lost Crops of the Incas*)

- Widely grown in the Central Andes in South America, and in New Zealand
- Small ‘yams’ are produced when days get shorter in autumn ie. From equinox around March 21
- Attractive clover-like foliage; easy to grow from cuttings and tubers; persists during frost-free winters
- Delicious; can be eaten raw or cooked
- Easy to propagate but the long wait for tuber production requires patience and some planning
- My adventures in Oca growing are described in my old blog at <http://peopleplantslandscapes.blogspot.com.au/2014/05/oca-or-new-zealand-yam-harvest-how.html>





*Oxalis tuberosa*  
- New Zealand  
Yam or Oca

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Small tubers  
forming in mid-  
April

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Oca or New Zealand Yam





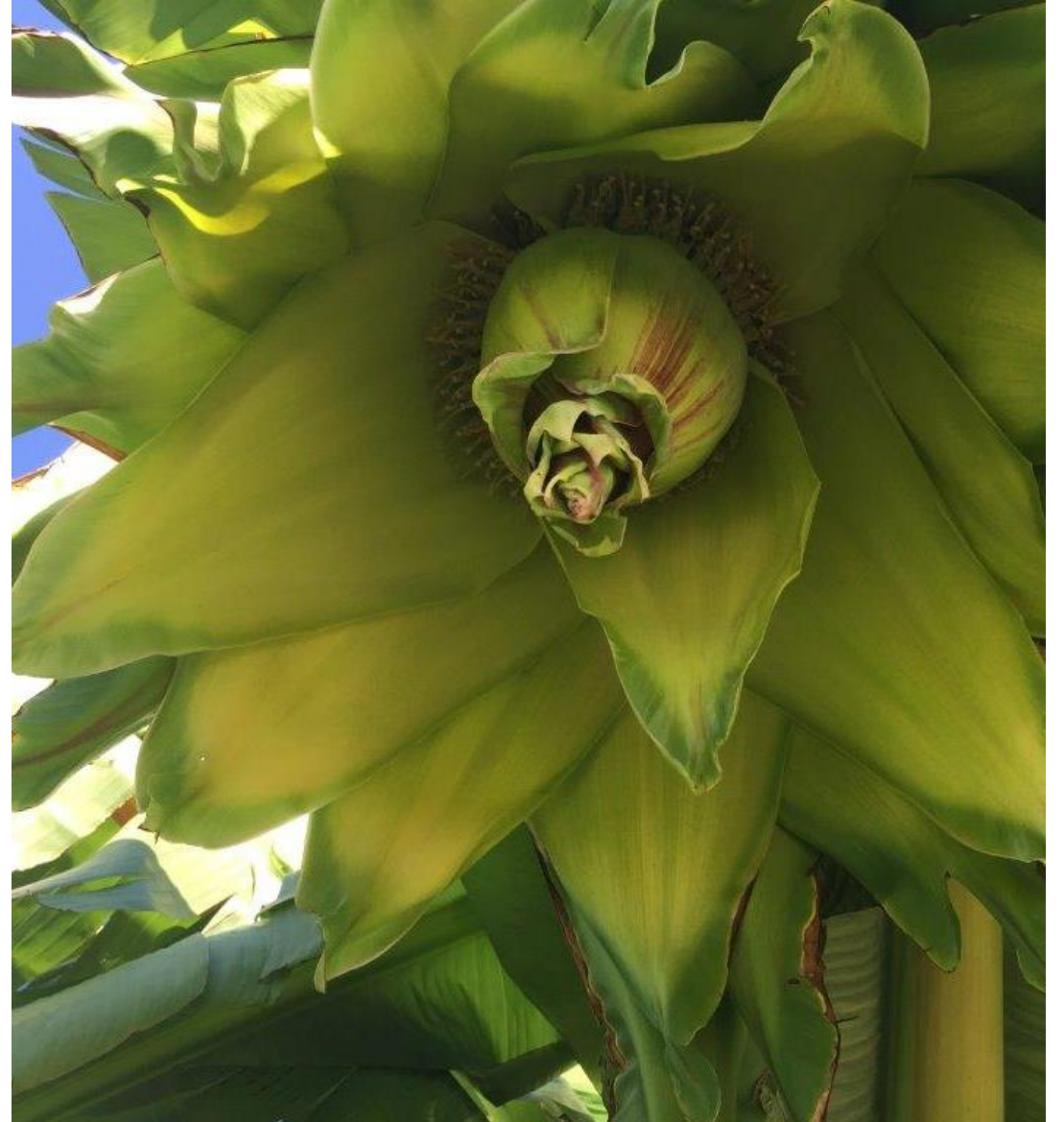




# Lost Crops of Africa: *Ensete ventricosum* Abyssinian Banana

- An important multi-functional food security staple in the livelihood gardens of the Ethiopian Highlands, especially for the Sombo people
- See: [www.youtube.com/watch?v=\\_dCal2iDXkY](http://www.youtube.com/watch?v=_dCal2iDXkY)
- Grows well in Melbourne, albeit challenged at the extremes of summer heat and winter cold!
- The giant corms are eaten, the leaves used for roofing. I've now given it a basic taste-test...
- Are there members of the Ethiopian community in Melbourne who miss this plant? Would this be an example of a 'culturally appropriate' food unavailable at present to this community? (I did in fact finally meet someone from the right community...)







**Enset does not produce “pups” or side shoots so these are induced through a wounding process. This allows for development of clones with useful traits.**





# White Yam

- *Dioscorea alata* – White Yam
- Family: Dioscoreaceae
- Produces big, gnarly starchy roots ideal for baking; an important staple in Africa, Asia and the Pacific
- Beautiful foliage and climbing habit; heat tolerant
- A popular vegetable in some communities in Melbourne and available at various markets eg. Preston, Footscray, Dandenong
- Propagation easy from cut pieces of tuber; trialling propagation and cultivation at Burnley to make this species more widely available through Novel Crops project



# White Yam





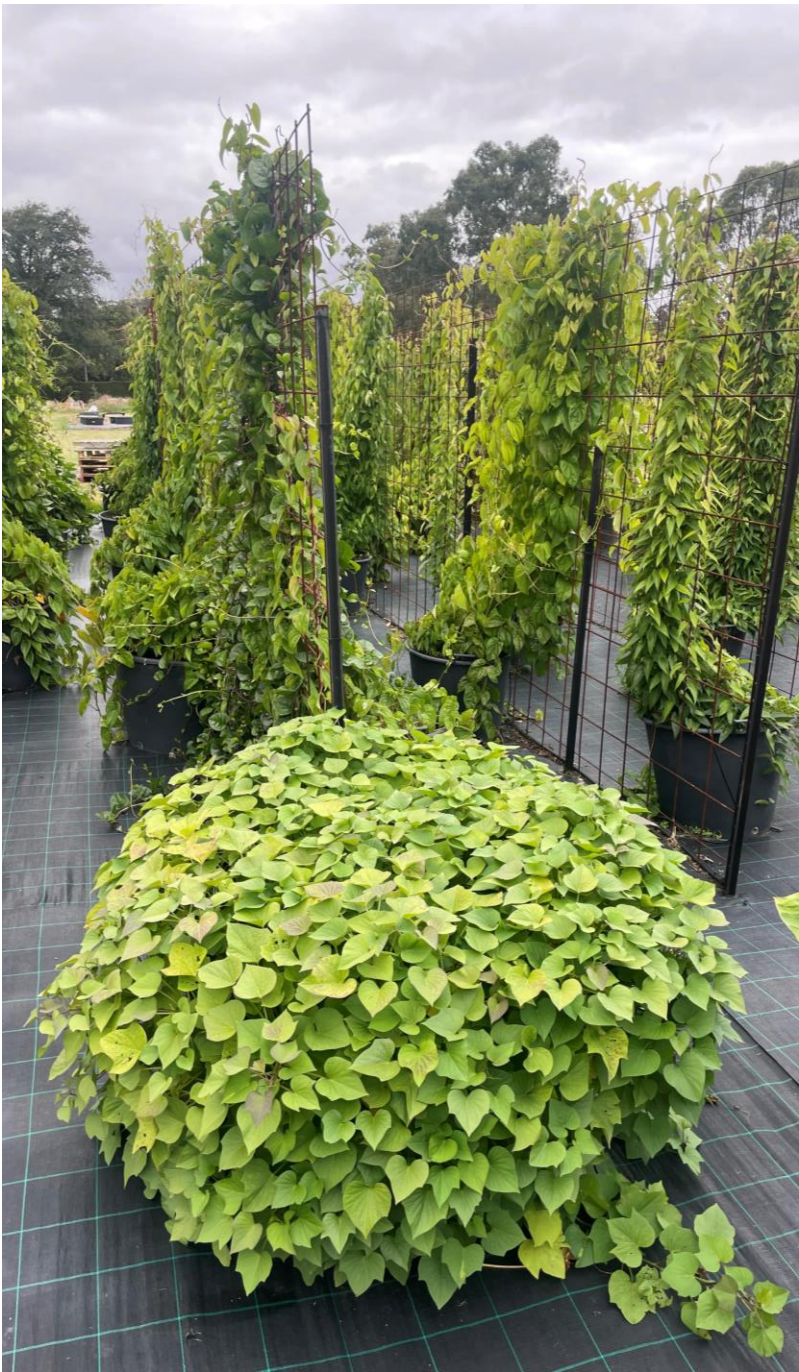




*Dioscorea  
transversa*  
– Australian  
species









## Latest news



Feature

### Staff Spotlight series: Meet Dr Chris Williams

Hear from Dr Chris Williams, lecturer in urban agriculture, about his Novel Crops project, recent collaboration with United African Farm and his bumper crop of African yams. Watch the video and learn how the unique inner-city climate at the Burnley campus is opening doors to some unexpected produce.

<https://vimeo.com/957506907/689f59e4bc>









# Taro

- ❑ *Colocasia esculenta* – **Taro**
- ❑ Exact centre of origin unknown, probably eastern India or Indonesia; cultivated for thousands of years, perhaps the first genuine human crop.
- ❑ an important staple in many countries (after wheat, rice, maize, potatoes, yams etc).
- ❑ Tubers and leaves must be cooked; heat tolerant; performs well in partial shade; survives mild frosts (surprisingly well!).
- ❑ Crop can stay in the ground for up to nine months; grows well in extremely moist soil. Will also grow in water although won't be as productive.











- In the interests of transparency, it's not a perpetual summer for these species!
- Taro in February (above); after a frost in Alphington (right)





Taro – *Colocasia esculenta* has become one of my my favourite perennial edibles

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# What does the Burnley Plant Guide say about Taro?

[« Previous page](#)

## Colocasia esculenta

[Printable Datasheet >](#)

*Click on the photo to view the image gallery*

[Add/Remove... >](#)

### Other details

**h x w at 5 years** 1-2 m x 1-2 m

**h x w at maturity:** 1-2 m x 1-2 m

**growth rate:** medium

**uses:** ornamental pond, container, perennial border, shrub or mixed border, accent

### Basic plant details

**family:** Araceae

**common name/s:** Black Taro

**other name/s:** Colocasia esculenta var. fontanesii, C. fontanesii

**group:** garden and landscape

**type:** perennial herb

**origin:** exotic

**climate:** temperate, subtropical, tropical

**invasiveness:** 2

**cultivation ease:** easy

### Environmental tolerances

**light:** semishade to full sun

**cold:** to 2 °C

**wind:** average

**salt spray:** average

**drought:** poor



## Description

### ORIGIN AND HABITAT

Tropical east Asia.

### PLANT TYPE AND HABIT/FORM

A stout evergreen perennial herb arising from a basal corm or corms.

### LEAVES

Basal, arrow-shaped, with large velvety blades with pointed or rounded basal lobes to 350 mm long, on stout purple-black petioles up to 1 m long.

### FLOWERS

A spadix in a spathe with a purple-black base, below the level of the leaves. Not often seen in ornamental plantings.

### CULTIVATION AND MAINTENANCE

In Australia, mainly grown as a dramatic foliage plant in warm climates; will remain evergreen outdoors at least as far south as Melbourne in a sheltered location.

Requires a fertile, moisture-retentive soil and reliable moisture. Will grow in shallow water to 150 mm deep. Some crop forms tolerate much drier conditions.

### PROPAGATION

Division.

### PESTS AND DISEASES

Generally trouble free. Tubers may rot in very cold wet soils.

### CULTIVARS

Black-stemmed forms are often sold as cultivar 'Fontanesii' (var. *fontanesii*, or *C. fontanesii*). 'Black Magic' has purple-black leaves, 'Rhubarb' has red stems, and 'Illustris' has leaves with purple patches. There are many more.

### INVASIVENESS

Taro is dispersed by water and humans, and although first recorded as naturalised only in 1996, it is now spread along many creeks and rivers. It has the potential to become a *major* weed along the tropical and subtropical coasts of Queensland and northern New South Wales.

### TOXICITY

The tubers contain calcium oxalate raphides which cause irritation to the mouth and digestive tract. They need to be removed by cooking and repeated washing before eating.

### NOTES AND COMMENTS

Despite the above, cultivated widely throughout the tropics as a food crop.

### NOMENCLATURE AND TAXONOMY

An extremely variable species, with 67 synonyms and more than 200 cultivars.

### ORIGIN OF NAME

*Colocasia*: an ancient name used by Virgil in 37 BC.

*esculenta*: edible.



Nursery  
availability?

From:  
[www.greenharvest.com.au](http://www.greenharvest.com.au)

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## Taro

Taro is one of the common names of *Colocasia esculenta*, an important staple food crop in many parts of the world. It is a perennial, tropical and subtropical plant mainly grown as a root vegetable for its edible starchy corm and as a leaf and stem vegetable. Regional names include dasheen (West Indies), inhame (Azores, Brazil), kochu (Bangladesh), tiquisque (Costa Rica), ggobe (East Africa), golgas (Egypt), kolokasi (Cyprus), dalo (Fiji), arbi, kosu, pan, bal, ghandyali, saru (India), satoimo (Japan), pindalu (Nepal), gabi (Philippines), pheuak (Thailand), Kalo (Hawaii).

Taro needs a long, frost-free growing season and plenty of water. It has large, green, heart-shaped leaves (commonly called elephant's ears), fleshy stems and grows up to 1.5 m in height. Taro is suitable for both wetland and dryland culture. It will grow well in partial shade, making it an excellent understorey plant. It needs consistent irrigation and a well-drained rich soil with plenty of organic matter.



### Taro 'Bun-long' syn. Purple Spot Taro **UT**

*Colocasia esculenta*

**Not to Norfolk Island, TAS or WA**

'Bun-long' is an excellent eating taro with a creamy white, dense, starchy flesh with purple flecks. It is a soft-cooking type desired in Asian cooking. The leaves are green with a purplish centre spot, the stems become reddish as they mature. The corms produced are large, often weighing several kilos.

[More info on growing taro...](#)

**Provided as tubestock.**

GT140 Taro Bunlong plant \$7.95 [Buy now](#)

GT141 Taro Bunlong plant (3) \$19.95 [Buy now](#) **Save \$3.90**



### Taro 'Chinese' **UT**

*Colocasia esculenta*

**Not to Norfolk Island, NT, SA, TAS or WA**

'Chinese' produces a smaller corm with a very white flesh. It is a soft-cooking type desired in Asian cooking. The leaves are dark green with purplish stems. This hardy plant is widely adaptable in subtropical and tropical areas including northern NSW.

[More info on growing taro...](#)

**Provided as tubestock.**

GT135 Taro Chinese plant \$7.95 [Buy now](#)

GT136 Taro Chinese plant (3) \$19.95 [Buy now](#) **Save \$3.90**



### Taro 'Pacific' **UT**

*Colocasia esculenta*

**Not to Norfolk Island, NT, SA, TAS or WA**

'Pacific' is an excellent eating taro with a creamy white, dense, starchy flesh, that stays relatively firm with cooking. It produces a large tuber, up to 3 to 4 kg, the heart-shaped leaves are dark green.

[More info on growing taro...](#)

**Provided as tubestock.**

GT124 Taro Pacific plant \$7.95 [Buy now](#)



## ***Nelumbo nucifera* – Sacred Lotus**

- Sacred flower of Hinduism and Buddhism
- Symbolism of beautiful flower (the purified mind) emerging from muck (the everyday mind of greed and desire) and flowering in the air (phyto-nirvana)
- ‘objectively’ beautiful outside of any religious symbolism!
- Edible rhizome, popular in Asian cooking.





*Nelumbo  
nucifera* – Sacred  
Lotus (edible  
rhizomes)













## Availability of *Nelumbo nucifera* – Sacred Lotus

- Not available in mainstream nurseries
- Blue Lotus farm at Yarra Junction – popular with Asian community in Melbourne; Geoff Cochrane grows Chinese cultivars suitable for cool to cold climates
- Does not yet sell cultivars bred for their large edible rhizomes, although these are usually available in Asian markets across the city (but not with viable buds)



# Kang Kong

- ❑ *Ipomoea aquatica*
- ❑ In the “morning glory” family, Convolvulaceae alongside Sweet Potatoes
- ❑ “The Broccoli of SE Asia”
- ❑ Aquatic plant but grows well in moist soil too
- ❑ Easy to strike from cuttings
- ❑ Raw or cooked (but mostly cooked)
- ❑ Nearly always available in Vietnamese grocers in Melbourne
- ❑ Loves the heat and will grow well in Melbourne for around three months (summer into early autumn)
- ❑ relatively high in beta-carotene, natural antioxidants, protein, carbohydrates, and dietary fibers.







# Hopniss or American Groundnut

- *Apios americana*
- Climber in the Fabaceae (pea family)
- Native to the United States east of the Rocky Mountains
- Riparian zone species or on wet soils
- Widely cultivated and eaten by indigenous people
- Edible tubers – these are the original “potatoes” brought back to England by Sir Walter Raleigh
- Cook like potato, higher in protein











# Water Chestnut

- ❑ *Eleocharis dulcis*
- ❑ Famous in Asian cooking but also found in Northern Australia and eaten by indigenous people
- ❑ The corms are harvested in late autumn and have a sweet crunchy texture and white flesh.
- ❑ The foliage dies down but the corms overwinter well in Melbourne's climate. Need full sun for a good yield.
- ❑ Source of carbohydrate and potassium



# Water Chestnut



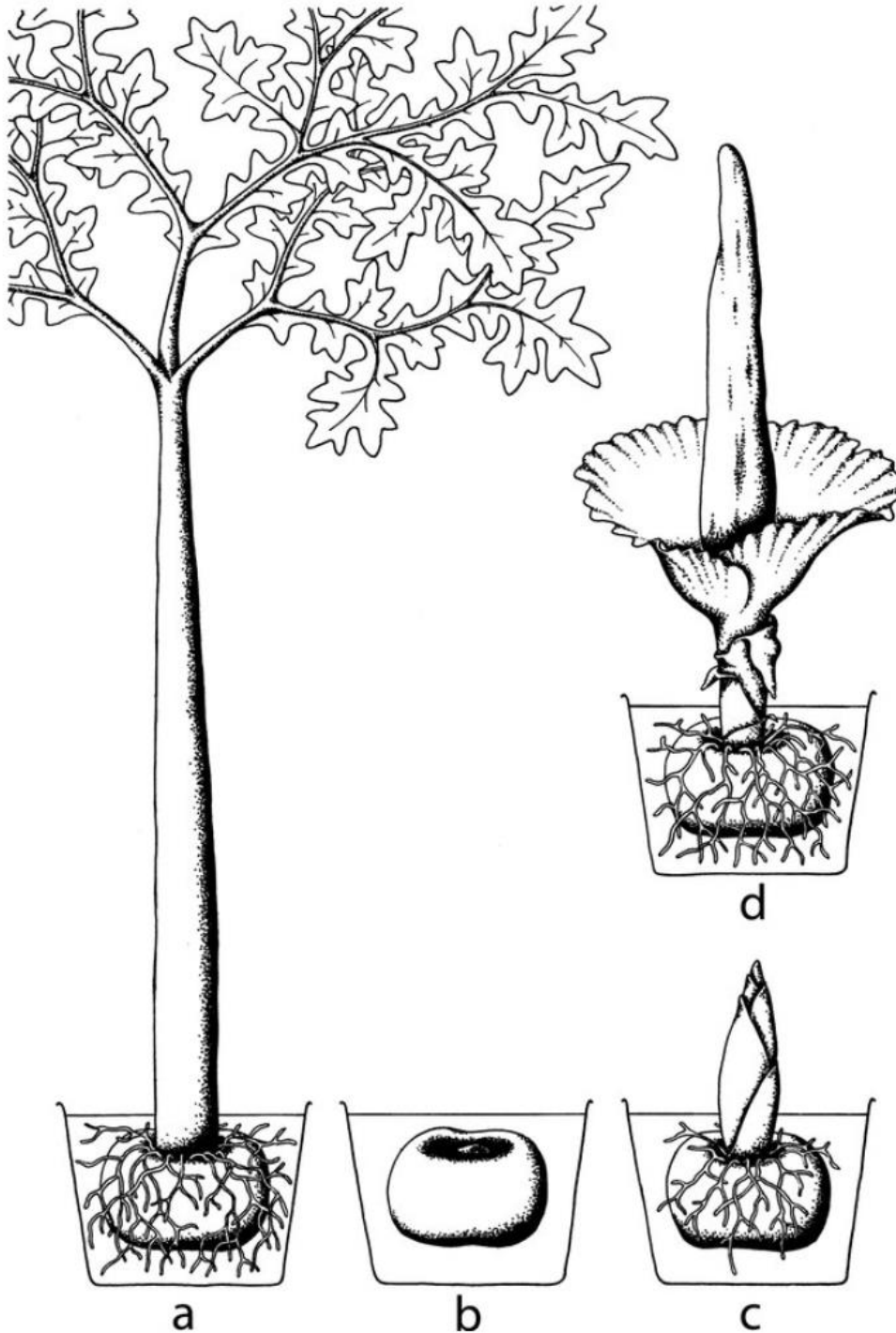












## Figure

Caption

fig. 4 lifecycle of Titan arum (*Amorphophallus titanum*): a) Tuber with leaf; b) tuber at dormancy; c) bud; d) inflorescence; usually after dormancy several periods with leaves occur until an inflorescence is produced. drawing: nils Köster.

The Cultivation of Titan Arum (*Amorphophallus titanum*) :

October 2007

[Sibbaldia The International Journal Of Botanic Garden Horticulture](#)





*Amorphophallus konjac* – easy to grow in Melbourne, especially in a pot



# Rare Konjac Corm Dinosaurs











**Elephant Foot Yam -**  
**#amorphophalluspaeoniifolius**







