

G07 Biology Botany

Caryophyllales II



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Cactus Music

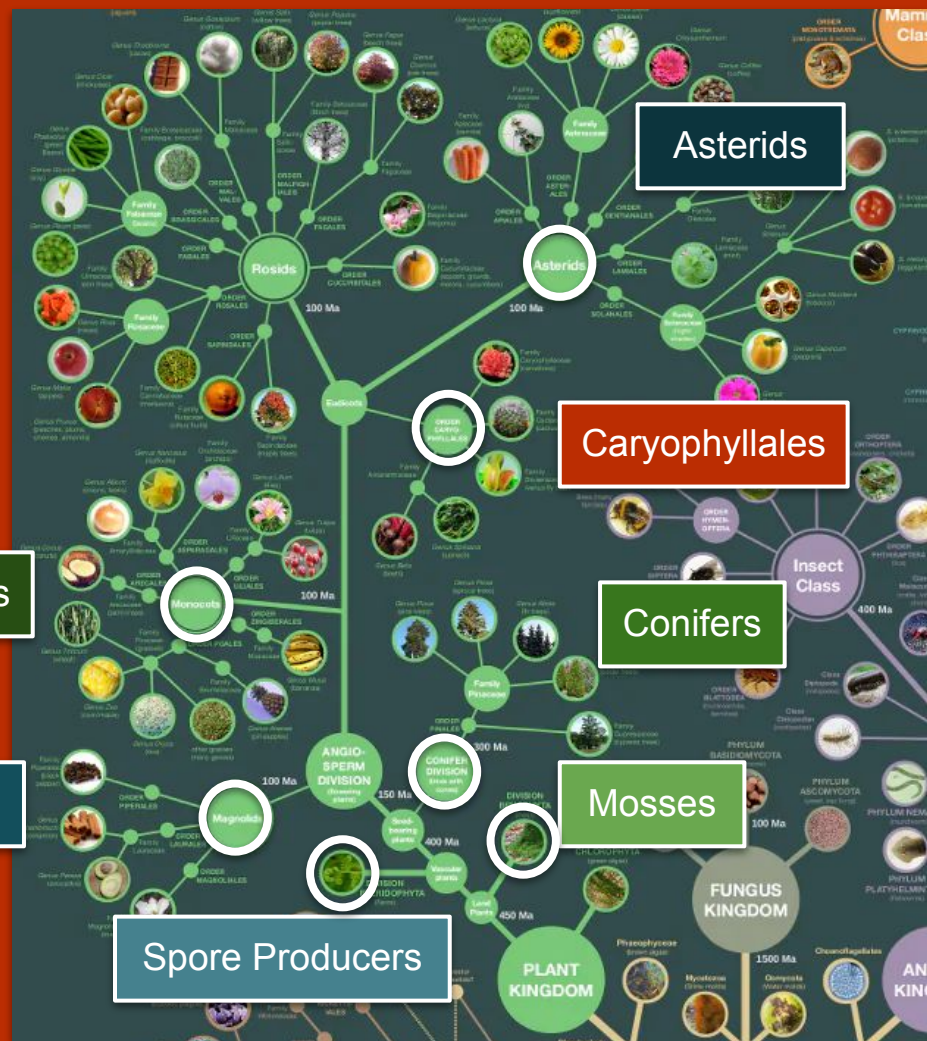
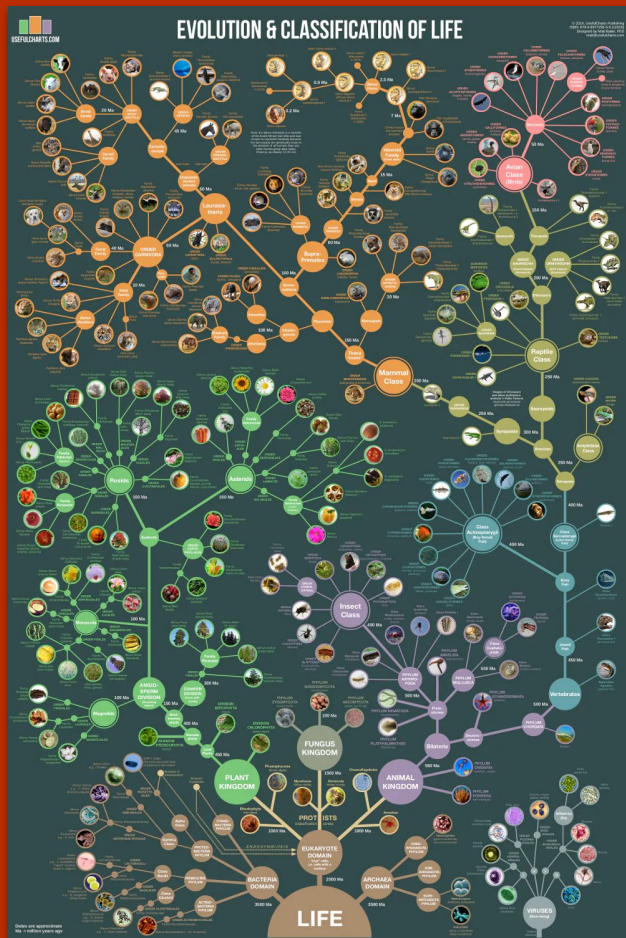
Topics & Concepts

Caryophyllales II

- ★ Cactus Family
 - Cacti
 - Thorns, Spines & Prickles
- ★ Pitcher Plants Family
- ★ Sundew Family

Basal Eudicots

- ★ Basal Eudicots
 - Basal Eudicots
 - Macadamia
 - Poppies
 - Opium Wars
 - Remembrance Day
 - The Golden Triangle
 - Heroin



Eudicot Orders

Asterids

44 families

80,000 species

125-120 mya

Caryophyllales

37 families

11,620 species

115 mya

Rosids

140 families

70,000 species

115-93 mya



Cactus Family

Cactaceae

1750 species

Cactus Family (1,750)

Cactus means “spiny plant”. They occur in a wide range of shapes and sizes and are native to the Americas, from Patagonia in the south to parts of Canada in the north. Only one other is found elsewhere in Africa and Sri Lanka.

Cacti live in very dry environments and have adapted to conserve water. Almost all cacti are succulents, meaning they have thickened, fleshy parts adapted to store water.

Most species of cacti have modified leaves looking like spines, which as well as defending against herbivores, spines help prevent water loss by reducing air flow close to the cactus and provide some shade. Their enlarged stems perform the essential photosynthesis.



Saguaro



Prickly Pear



Cholla



Cacti

Cactus Family (1,750)

With over 1,750 species of cactus across the Americas, from top to bottom, you could spend a lifetime finding them and photographing them.



The easily recognised
saguaro cactus of
Arizona



1,750 Species of Cacti

Thorns, Spines & Prickles

Thorns, Spines & Prickles

- Thorns are modified shoots
- Spines are modified leaves
- Prickles are modified bark and can be snapped off
- Bristles are a type of plant hair.



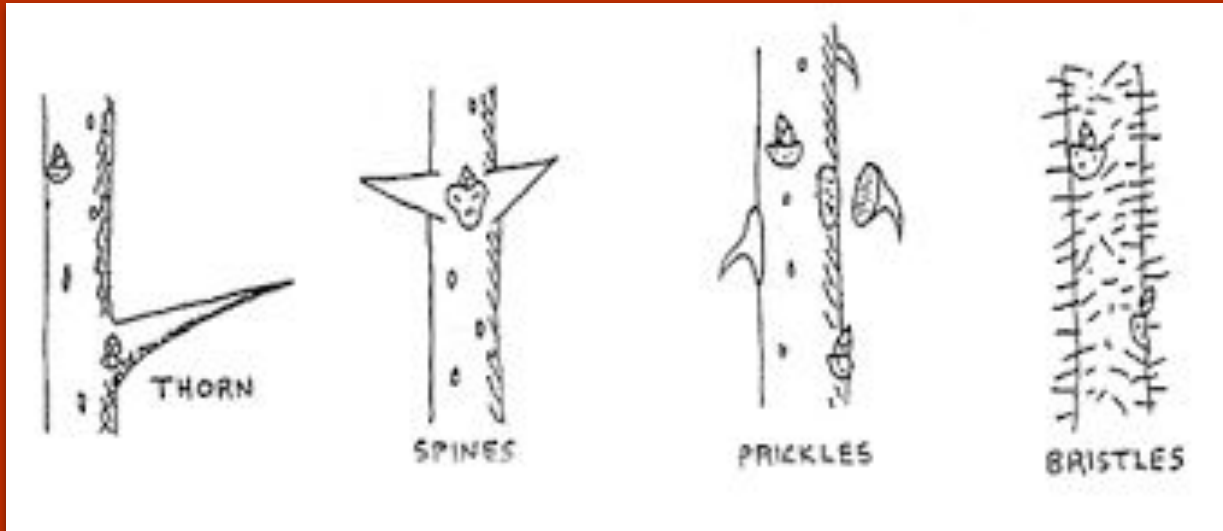
Thorns



Spines



Prickles





Teddy Bear Cactus



Pitcher Plant Family

Nepenthaceae

170 species

Pitcher Plant Family (170)

Nepenthes is the only genus of the family Nepenthaceae of carnivorous plants. Commonly known as tropical pitcher plants and monkey cups.

Preferring the Old World with most species found in Borneo and Sumatra of Indonesia and the Philippines.

Indonesia (95)

Philippines (61)

Malaysia (20)

Thailand (16)

Australia (4)

Madagascar (2)

Seychelles (1) India (1) Sri Lanka (1) New Caledonia (1).



Nepenthes alata



Nepenthes alba



Pitcher Plants



Sundew Family

Droseraceae

180 species

Sundew Family (180)

Droseraceae are carnivorous herbaceous plants that may be annuals or perennials. Their flowers are bisexual (Both male & female parts). Their flowers are insect-pollinated, typically with white to purple flowers that close at night. Their small seeds that are dispersed by wind and water.

They are able to supplement their nutrient intake by capturing and digesting small animals such as insects. In this way, these plants are able to thrive in nutrient deficient areas. They trap prey by secreting a sticky substance from hairs on their leaves.

There are three genera; Drosera contains 178 species. Dionaea has just 1 species & Aldrovanda 1 species.



Drosera Tokaiensis



Dionaea Muscipula



Aldrovanda Vesiculosa



Venus Fly Trap (*Dionaea Muscipula*)

Caryophyllene Families (37)



Carnation
2,625 23%



Amaranth
2,040 17%



Fig-Marigold
1,800 15%



Knotweed
1,200 10%



Cactus
1,750 15%

Plus
26 Families
495 Species
4%



Leadwort
725 6%



Four O'Clock
290



Spring Beauty
230



Purslane
115



Pitcher Plants
170



Sundew
180



Basal Eudicots
Droseraceae
180 species

Basal Eudicots

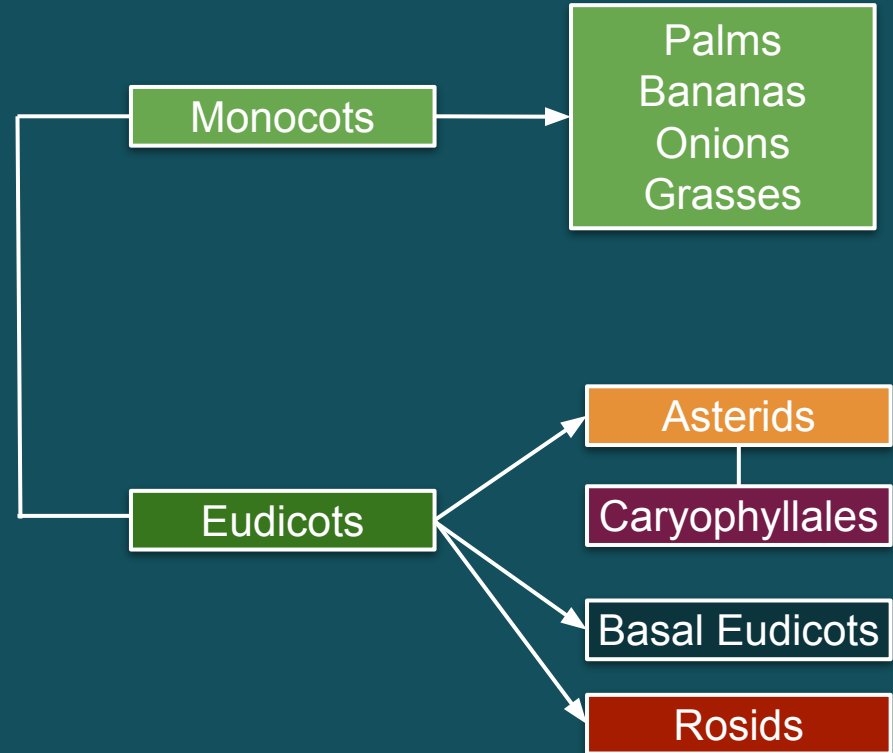
We classify flowering plants into two groups, monocots and dicots, a modern word for dicot is eudicot.

The monocots gave us the palms, bananas, onions and grasses.

The eudicots gave us two core groups the asterids and the rosids.

Caryophyllales are part of the asterid core group.

There is one other minor group known as the basal eudicots.



Basal Eudicots

This group consists of 4 orders containing 13 families.
The four orders are called:

1. Ranunculales (contains buttercup and poppies)
2. Proteales (contains banksia and macadamia)
3. Trochodendrales (1 family only 2 extant species)
4. Buxales (3 families of evergreen shrubs)

We shall take a look at the macadamia, which isn't a nut, and the story of the poppy and how it relates to the opium wars, the story of Hong Kong, why it is an iconic World War 1 symbol and how it devastated New York in the 1970's.



Macadamia Nuts

The macadamia nut is commonly known as the Hawaiian nut in the United States. But it is neither a nut nor is it indigenous to Hawaii.

It isn't a nut. It's a seed.

Macadamia are indigenous to Australia. Seeds were only introduced into Hawaii in the 1880s from Australia, long before it was annexed by the United States in 1898.

They are named after the Scottish-Australian chemist John Macadam. There are a number of different species found in northern New South Wales and central and southern Queensland.

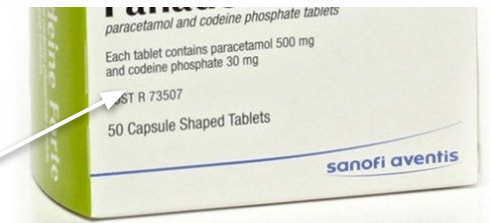


Poppies

A poppy is a flowering herbaceous plant, often grown for their colourful flowers which can be red, white, pink, orange yellow, blue or purple.

One species of poppy produces edible seeds but is also the source of the narcotic drug mixture opium which contains powerful medicinal alkaloids such as morphine. Morphine is widely used legitimately in the medical sector as a strong painkiller. Today codeine is widely available in supermarkets in such medicines as Panadeine and Nurofen plus.

However opium can also be used as a narcotic, an illegal drug, and is the precursor to heroin.

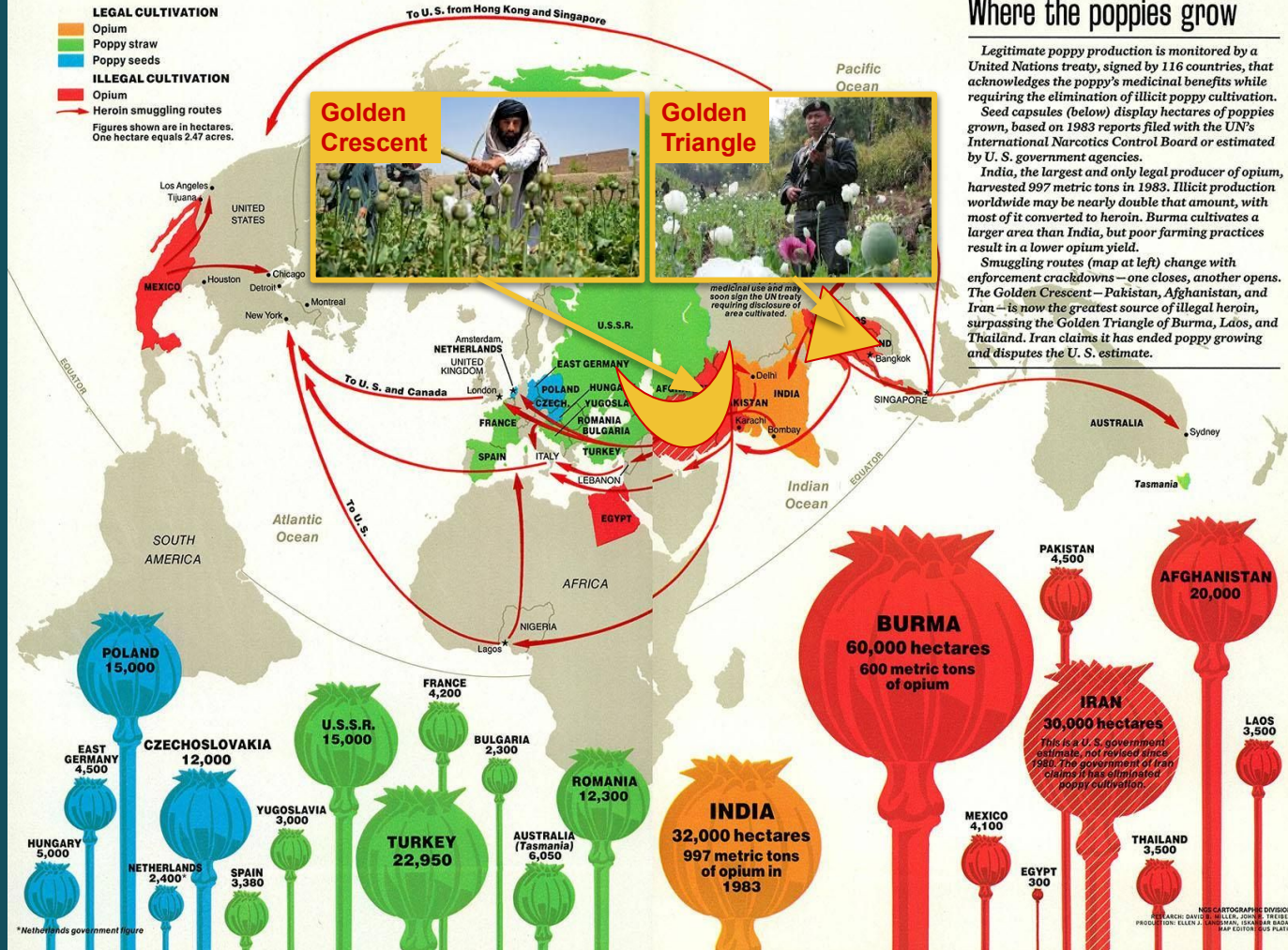


Poppies

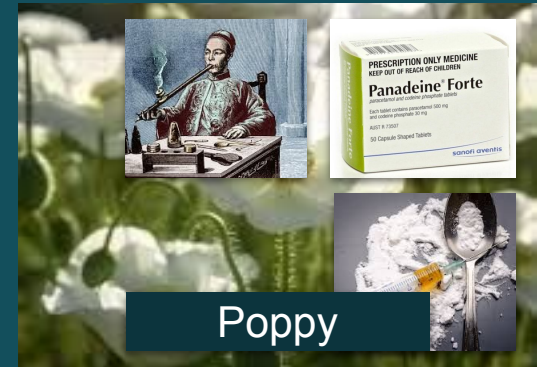
Most poppies are grown illegally in Burma (now Myanmar), Iran & Afghanistan who smuggle opium worldwide.

India makes the medicines.

Europe produces seeds.



Plants Containing Opioids (Drugs)



Opium Wars

In the 1800's Britain used to trade Opium, from its other colonies, with China, in exchange for tea and porcelain. Poppies are a plant, containing opioids, traditionally used in medicine as a painkiller, ideal for wounded soldiers. Tea is also an opioid and traditionally drank as a watery liquid.

Britain was forced to trade with just a few powerful Hong Kong merchants who controlled the trade within China. These Chinese merchants created a business selling opium to people to smoke. This led to what were called opium dens.



Opium Wars

The Chinese Government decided to tackle the problem by destroying opium stocks owned by British traders, not the Chinese merchants.

Britain sent their navy to persuade the Chinese Government to pay for the opium that they had destroyed and to allow them to trade with anyone.

A three year war ensued. Britain won the war in 1842. The Treaty of Nanking saw Hong Kong Island become a British trading hub allowing for free trade with any merchants in China. The Chinese paid for the opium that they had destroyed.

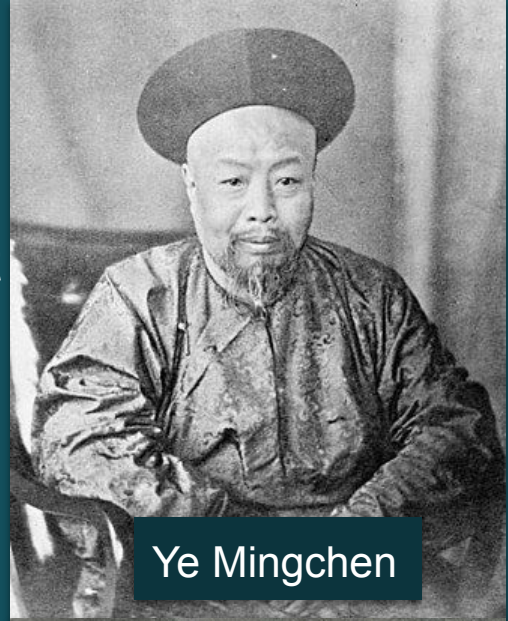


Opium Wars

The new Commissioner was determined to stamp out the opium trade. In 1856 he seized a British ship in Hong Kong harbour and placed some crew in chains.

After 3 more years, in 1860, as a result of the 2nd Opium War, China legalised the opium trade and ceded the Kowloon peninsula to Britain. At the same time China also ceded 1.5 million square kilometres of land to Russia, under the Amur Annexation treaty.

A 99 year lease on the New Territories was signed in 1898. In 1997 Britain returned all lands back to China under the condition that they remain independent.



Ye Mingchen



Remembrance Day

The poppy fields of Flanders in Belgium are where lengthy periods of fighting took place during World War I. The poppy is the symbol of remembrance, on the 11th hour of the 11th of November every year, for the fallen soldiers in battle.



In Flanders Fields

In Flanders fields the poppies blow
Between the crosses, row on row,
That mark our place; and in the sky
The larks, still bravely singing, fly
Scarce heard amid the guns below.

We are the Dead. Short days ago
We lived, felt dawn, saw sunset glow,
Loved and were loved, and now we lie
In Flanders fields.

Take up our quarrel with the foe:
To you from failing hands we throw
The torch; be yours to hold it high.
If ye break faith with us who die
We shall not sleep, though poppies grow
In Flanders fields.

John McCrae

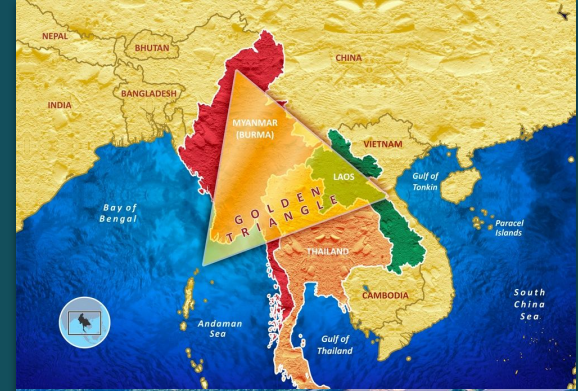


The Golden Triangle

The Golden Triangle is a large, mountainous region in northeastern Myanmar, northwestern Thailand and northern Laos.

The Golden Triangle has been one of the largest opium-producing areas of the world since the 1950s. Most of the world's heroin came from the Golden Triangle.

Today, the Thai side of the river confluence has become a tourist attraction, with an Opium Museum and no opium cultivation.



Heroin

In the 1970's, a New York gangster named Frank Lucas realised that he could import pure heroin, from opium, directly from the Golden Triangle.

In the media it is believed that the drugs were shipped by the military in coffins of dead soldiers via military aircraft, but this doesn't appear to be true.

According to those who were involved, they secretly smuggled the drugs into the United States hidden inside specially adapted wooden furniture.

Over 100 people were convicted. Lucas got 70 years.





The Golden Triangle



English with
2 Little Pigs

The End