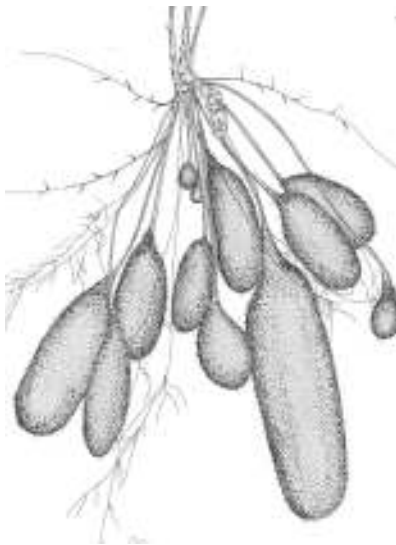


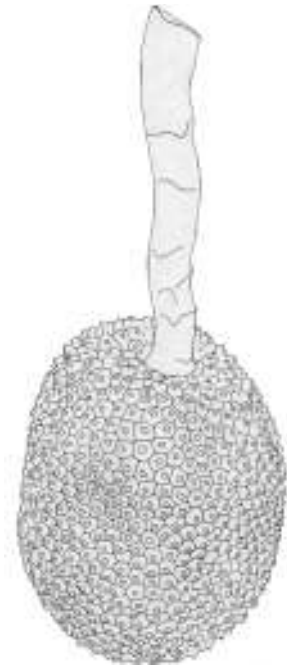


Food Crops



of

**Papua New
Guinea**



**An introduction to the crops,
their importance and distribution
in Papua New Guinea**



Bruce R French

Dedication

This book is dedicated to our Creator who has made about 20,000 edible plant species. The Psalmist and other writers in the Bible say that God actually enjoys his Creation. He also asked us to be good stewards of His world. This book is therefore dedicated to the many subsistence farmers who do this well, taking care of His world and especially to those who enjoy doing it.

The author

Bruce French has enjoyed visiting and working in Papua New Guinea during many trips from 1967 until the present. He now lives in Tasmania and continues to search for information on the edible plants of the world and how they could be better used to help hungry people feed themselves.

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If you are wanting more detailed or specific information on plants there is a database on CD covering all the edible plants known to be in Papua New Guinea.

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Introduction

Papua New Guinea is often spoken of as the land of diversity with many different cultures, languages, plants and animals. This is also true of the food plants that people grow and eat.

When I first arrived in the country I was not sure what many of the plants were or how they are used. Village people and women in markets were always very kind, helpful and patient teachers.

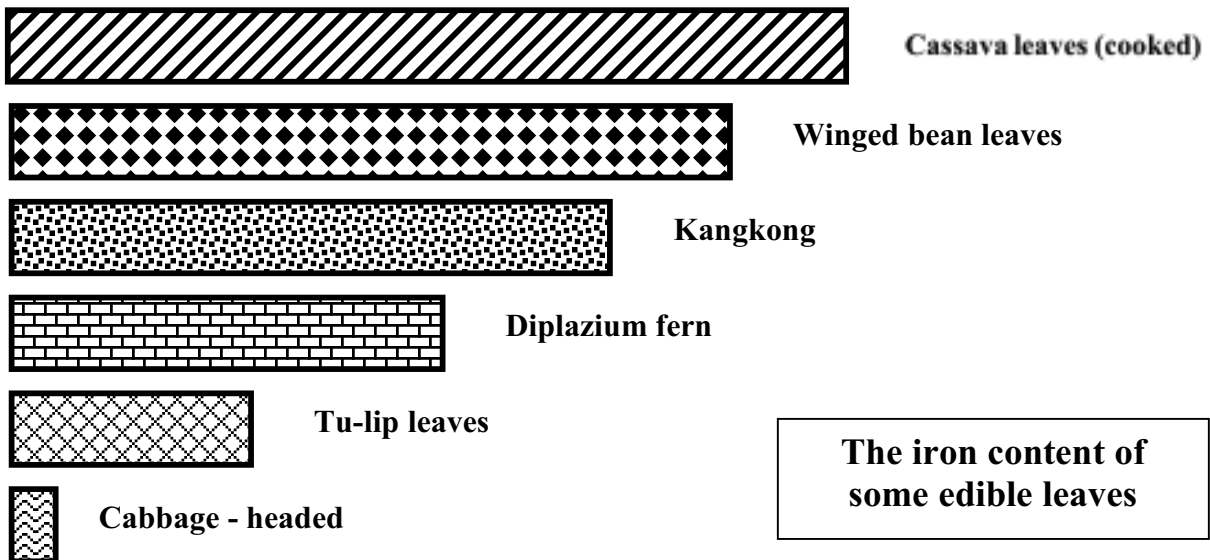
Because people move plants around and new food plants have been brought into the country, now other people also are unsure about some plants and what they are called and how they are used.

This book is designed as a very simple introduction to the more common food plants seen around Papua New Guinea. It is hoped people will take a greater pride and interest in these plants and become proud and informed about how to grow and use them well.

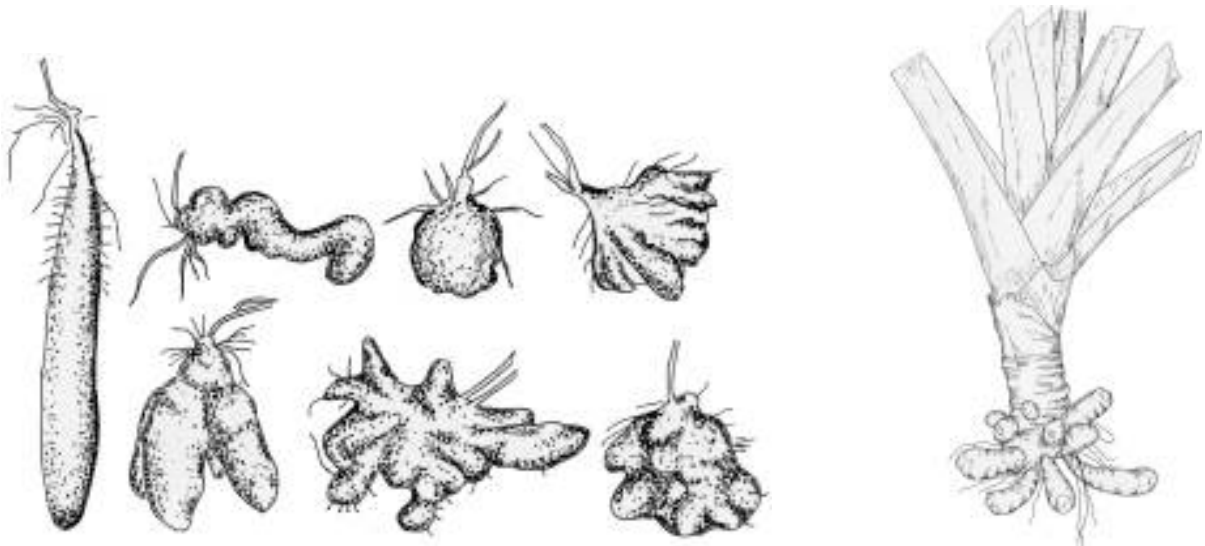
Many of the food plants of Papua New Guinea are very good quality foods. Unfortunately people are often rejecting traditional food plants and growing more of the introduced vegetables such as cabbage. These do not have the same food value as many of the traditional, tropical, dark green leafy vegetables.

Papua New Guinea has over 1,000 different species of edible plants. Some of these are only harvested from the wild and others are only known in small areas. Many others occur with hundreds of varieties and are the main food for people in the different regions.

The following diagram highlights the value of traditional leaves. Iron is a nutrient that is very important for our bodies and especially our blood. People who are short of iron become anaemic and lack energy. It is an example of how some foods are better for us than others.



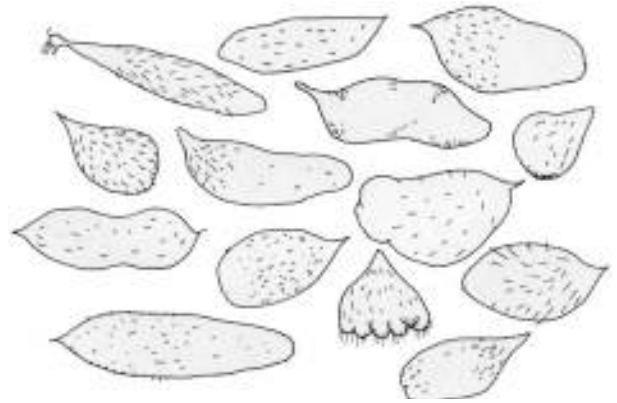
Information on all these plants, their food value and the pest and diseases that damage them is being made available in other publications. This one is a simple introduction.



Root Crops



and other
starchy staple foods



Sweet potato

Sweet potato is common in most areas of Papua New Guinea up to about 2600 m above sea level. Sweet potato will not grow in flooded ground, so in wet places (or soils with a lot of clay) it needs to be in large mounds.

There are probably about 5,000 different kinds of sweet potato in PNG. Some of the very big kinds do not have a lot of energy food, so are fed to pigs. In the Highlands, sweet potato is normally sweeter than when grown in the lowland areas. On the coast some kinds of sweet potato are ready to eat in 6-8 weeks after planting but at high altitudes above 2,000 m plants can take almost a year to be ready.

Sweet potato is normally grown, by using the tips of the vines.

Fongaar (*Ipomoea tuba*)

In the Western Province there is another plant in the sweet potato family that is grown for its tubers. The vines climb up stakes like a yam and the leaves are round, but the flower is like a sweet potato flower. Under the ground there are some long tubers that look like cassava roots. These are cooked and eaten.

Plants are grown from the top of the tuber. Some village people talk about it as if it is another variety of yam.

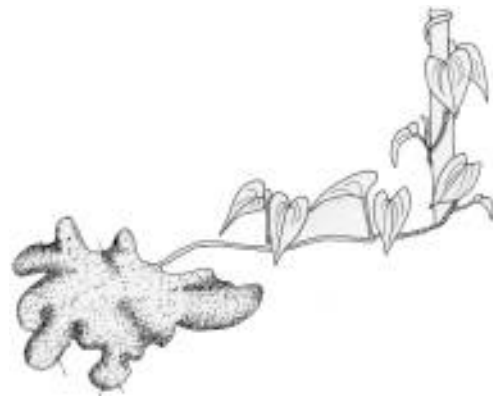
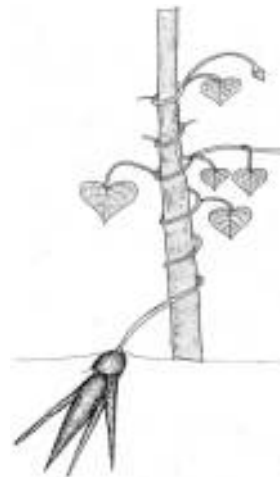
The yams

There are 5 main yams used for food in Papua New Guinea.

Greater yam

This yam is often called "Yam tru" in Tok Pisin. It climbs up stakes and has heart shaped leaves that grow in pairs opposite one another. The vine has wings or angles on it. Under the ground there is normally one large tuber. This can vary a lot in shape and colour. It usually takes 5-6 months to grow and can be stored for almost a year. The leaves die back before the tuber is harvested.

In some areas it is important in yam growing competitions and ceremonies



Nummularia yam

This yam is very similar to Yam tru, but has round vines and can often have some thorns near the base. The leaves are heart shaped and there is usually one large tuber under the ground.

Scientists are still trying to work out clearly the difference between this yam, greater yam and another yam with 3 leaflets.

At least in Vanuatu people grow this one commonly to crush up and cook as a paste in their food dishes.

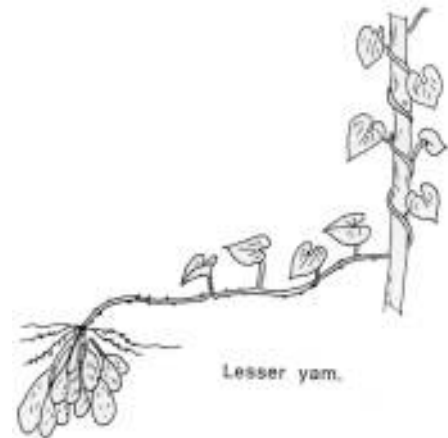


Lesser yam

This yam climbs up stakes and has thorny vines. Under the ground there are usually some shoots with very large thorns. The leaves are almost round and grow one after another along the vine.

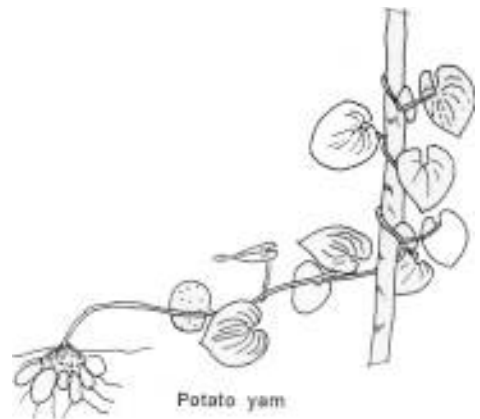
Under the ground there are usually several tubers in a group. These can vary in colour, shape and appearance.

This yam is mostly in coastal regions and takes about 9 months to grow and can be stored for about 2-3 months.



Potato yam

This yam can have a very long vine that can climb up trees and cover very large stakes. The leaves are large and round. The vine is smooth. Often there are fairly large “potatoes” or bulbils produced along the stem. These vary in colour and shape and size. With several varieties these are picked off and cooked and eaten. Under the ground there is normally only one smaller tuber that in some varieties is also cooked and eaten.



Five leaflet yam

Five-leaflet yam has between 3 and 5 leaflets spread out like fingers on a hand. Some varieties of this yam can be wild and bitter but other kinds have tubers that are cooked and eaten.

There are some other wild yams in Papua New Guinea but also kinds grown in Africa that have been introduced recently to Papua New Guinea.



The taro family

Taro tru

This is one of the very traditional food plants of Papua New Guinea. It is grown in most places in the country and some wild varieties are also self-sown along creeks and drains. Since the time of the Second World War a disease called taro blight has made it harder to grow this plant well especially in hot, wet locations. The leaf stalk in taro tru joins onto the leaf blade away from the edge of the leaf.

The top of the corm with some of the leaf stalks attached is normally planted in a hole dug in the ground. This hole is left open. The plant forms suckers around the side and these can grow large enough to harvest and eat or be used for planting.

There is a slightly different variety grown in some drier places where the leaves die right back and the ring of corms left behind will store for a few weeks before being replanted in the next rainy season. Taro tru leaves are also very good food when cooked.



Chinese taro

This taro is often larger than taro tru and has leaves that are divided right up to the leaf stalk. There is also a vein around the edge of the leaf.

The main corm of Chinese taro is larger and around the side growing out at the same angle as the ground there are several smaller corms. It is normally these that are grown and eaten. Sometimes the large central corm is left growing for a few years and the side corms are harvested,

This taro will not grow properly in very wet soils.



Giant taro (Paragum)

This taro grows wild in most places in Papua New Guinea even up to high mountain regions. It is only grown and used as food in a few places. This mainly occurs near Rabaul and in New Ireland. This plant is an important food in other Pacific islands.

The leaves of this plant stick almost upright and the base of the leaves has large rounded lobes.

Often this plant has to be very carefully peeled and cooked before it is eaten.



Swamp taro

This taro normally grows in swamps in coastal regions. The leaves are pointed and at their base there are long pointy lobes. The leaves tend to stick upright. The tuber under the ground can take several years to grow large and this is often only used as a reserve food in times of food shortage.

It is grown and used in North Solomons Province and some other places.



Elephant foot yam

This plant looks very different to a normal taro plant but it tastes like a taro. The leaf stalk is round and sticks straight up and at the top a large leaf spreads out and this is divided into lots of small leaflets.

The plant grows in many drier grassland areas and is often never used as food but is grown and eaten in some places, especially the Sepik region. It is grown and used in several Asian countries.

Under the ground the tuber is large and round like an elephants foot! When the leaves die back this is harvested and it can be stored for several months. If you keep this for a long time it will eventually produce a very large flower that has a very bad smell like rotten meat. This is to attract flies to pollinate the plant!



Cassava

Cassava or Tapiok has become a common and widely used root crop because it will grow on poorer soils and is easy to grow.

The cassava plant has a long woody stalk that can form branches near the top. The leaves are divided into leaflets arranged like fingers on a hand. A few different varieties occur. Under the ground a series of long fattened roots spread out around the side of the plant. These are harvested and cooked and eaten.

All cassava can have a bitter poison called cyanide so it is important to cook cassava in a hot fire or boiling water to make sure all this poison disappears. The young leaves of cassava can be cooked and eaten and are good quality food. They too need to be cooked well.

Cassava is grown, by planting sections of the stalk, into the ground.



Bananas

Papua New Guinea is probably one of the main original homes, for most of the bananas in the world. There are over 500 different kinds of bananas. Some of the traditional ones have leaves which stick more upright and they have fewer suckers around the side. Often, the bunches of fruit are smaller. Other kinds have leaves that bend over and there are more suckers around the side. Many of these are easier to grow but they take longer to get ready. Some kinds will grow on poorer soils and get less damaged by diseases.

Because there are so many kinds of bananas people eat some fresh, while others they quickly roast in the ashes and others they boil in pots. They have lots of traditional uses



Sago

There are 2 different sago palms in Papua New Guinea. One grows in most places in the swamps and another kind grows in North Solomons on slightly drier ground.

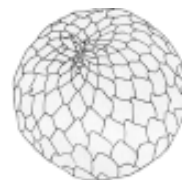
The main sago in the Sepik and Fly rivers and other swampy places has many different varieties and often some kinds just grow wild. In some places such as Lake Kutubu, all sago is planted.

This large palm takes about 15 years to grow and have sufficient starch stored in the trunk to be ready to harvest. If it is left too long it produces a large flower that uses up the stored starch.

When the main trunk is cut down and cut up to pound the starch out of the fibres in the trunk, another sucker starts to grow more quickly to replaces the trunk that was harvested,

Sago is a good energy food but is short on protein and other nutrients.

The sago palm in North Solomons and the Solomon Islands is a larger plant with very large leaves, large flower and large seeds. It mostly does not have suckers and is grown from seed. It does not have as much starch and is often tougher with more fibres than the other sago palm.



Arrowroots

Polynesian arrowroot

This small plant grows in drier coastal areas, especially along the Papua Coast. The leaves look quite similar to Elephant Foot Yam. There is a stalk with a divided leaf at the top. The flower has long hanging threads. Under the ground there is a round tuber that is harvested and eaten after processing and cooking.



Queensland arrowroot

This lily like plant is often grown in flower gardens but also has a starchy corm that is cooked and eaten. It is more common around Port Moresby in Papua New Guinea and has been introduced.



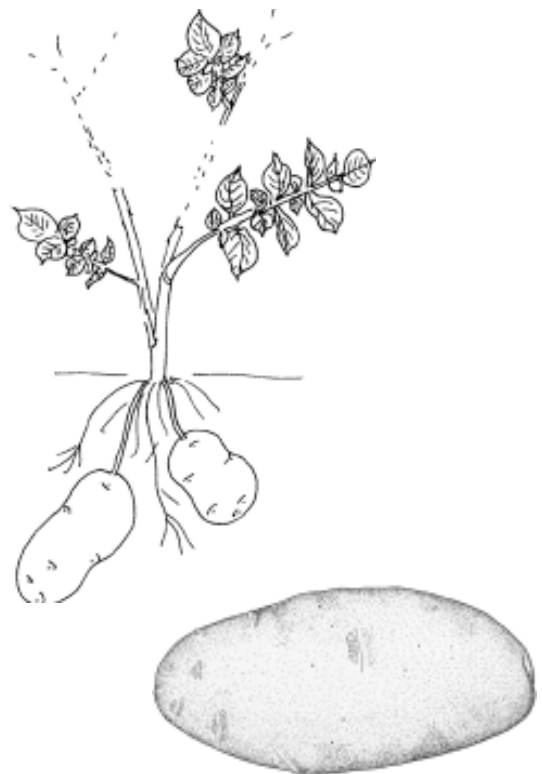
Potato

European or Irish potatoes are really a crop from the Andes in South America but are grown very widely in cooler temperate places. In Papua New Guinea they can be grown above about 1300 m altitude and grow much more quickly than sweet potato at altitudes above 2000 m. Often potatoes and karuka pandanus can be seen growing in the same garden.

A potato plant grows from the buds or “eyes” of the tuber and there are several shoots and the leaves are divided into many leaflets. Flowers have 5 petals and these can be purple or white.

Under the ground normally several tubers are produced. Tubers have to be stored for some time before they will regrow. The tubers that are to be eaten should not be left in the sun as this makes them go green and poisonous.

A disease called potato blight can kill the leaves in cool wet weather. It causes dead spots. Another disease causes plants to wilt and die and this can be prevented by making sure plants are mixed up in the garden and not touching each other.

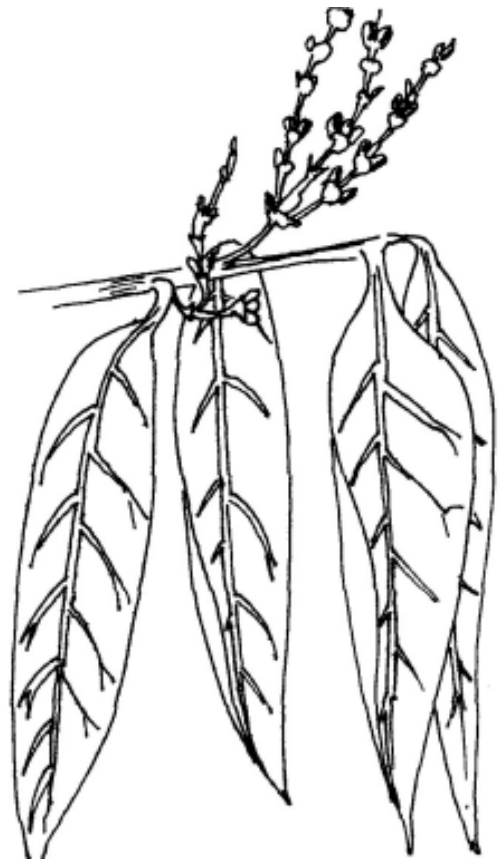


English Plant name	Tok Pisin name	Scientific name
Sweet potato	Kaukau	<i>Ipomoea batatas</i>
	(Fongaar)	<i>Ipomoea tuba</i>
Greater yam	Yam tru	<i>Dioscorea alata</i>
Nummularia yam	Yam tru	<i>Dioscorea nummularia</i>
Lesser yam	Mami	<i>Dioscorea esculenta</i>
Potato yam		<i>Dioscorea bulbifera</i>
Five leaflet yam		<i>Dioscorea pentaphylla</i>
Taro	Taro tru	<i>Colocasia esculenta</i>
Chinese taro	Taro kongkong	<i>Xanthosoma sagittifolium</i>
Giant taro	Paragum	<i>Alocasia macrorrhiza</i>
Swamp taro		<i>Cyrtosperma merkusii</i>
Elephant foot yam	Wild taro	<i>Amorphophallus paenifolius</i> var. <i>campanulatus</i>
Cassava	Tapiok	<i>Manihot esculentum</i>
Banana	Banan	<i>Musa sp (A&/orB)cv</i>
Sago	Saksak	<i>Metroxylon sagu</i>
Solomon's sago	Saksak	<i>Metroxylon salomonense</i>
Polynesian arrowroot		<i>Tacca leontopetaloides</i>
Queensland arrowroot		<i>Canna edulis</i>
Potato	Patete	<i>Solanum tuberosum</i>



KUMUS

(Green leafy vegetables)



Kumus (Green leafy vegetables)

Papua New Guinea has a lot of very nice tasting green leafy vegetables. Many of them are very good quality food. They provide protein to grow healthy bodies and vitamins and minerals to help protect us against disease and sickness. They don't all have common English or Tok Pisin names. Most of the traditional "Kumus" have Tok Ples names but some of the more newly introduced "Kumus" don't have any local names. Often they are just called "Kumu".

They can probably most easily be divided into 4 groups:

1. Those grown in gardens especially for their edible leaves;
2. Plants grown for other reasons but which have leaves that can be eaten;
3. Leaves harvested from plants that grow wild in old gardens or in the bush;
4. Fern fronds that are eaten.

Many leaves contain poisons so must never be eaten. Some leaves which people eat may not be good and it would probably be better not to eat them. Some leaves need cooking or processing before being eaten. Others are just excellent food.

Some of the more common of these groups of Kumus are listed in the tables below. Not all the wild edible leaves or ferns are included.

Plants grown in gardens mainly for their edible leaves

Aibika *	Wandering Jew	Chinese cabbage *
Amaranth *	Celosia	Indian mustard
<i>Rungia</i> *	<i>Dicliptera</i>	Pumpkin *
Waterdropwort *	<i>Ficus copiosa</i> *	Choko *
Tu lip *	Highlands "kapiak"	Silver beet
Blackberried nightshade*	New Zealand spinach	Spinach
		Waterleaf
<i>Nasturtium schlechteri</i> *	<i>Basella</i>	Lettuce
	Valanguar	Mulberry *
Kangkong *	Comfrey *	<i>Ormocarpum</i>
Watercress	Chilli *	Cabbage *

The most commonly used ones are marked with a star *.

These plants will be described in more detail after lists of the other groups of kumus have been included.

Plants mostly grown for other reasons but which have leaves that can be eaten.

Sweet potato *	Cowpea	Eggplant
Taro tru *	Rice bean	Celery
Chinese taro	Chickpea	Parsley
Giant taro	Scarlet runner bean	Carrot
Swamp taro		Cauliflower
Elephant foot yam	Brussels sprouts	Beetroot
Cassava *	Broccoli	Endive
Breadfruit *	Kohl rabi	Cashew nut
Oca	Turnip	Mango
Ulluco	Swede	Golden apple

Winged bean *	Japanese radish	Soursop
Lima bean	Spring onion *	Jackfruit
Lablab bean	Onion	Durian
Common bean	Garlic	Mon (Tok pisin)
Peanut *	Chives	Pawpaw
Snake bean *	Bottle gourd *	Lemon grass
Pea	Cucumber	Mint
Pigeon pea	Snake gourd	Thyme
Broad bean	Angled loofah	Sweet basil
Mung bean	Okra	Dill
Soybean	Capsicum	Lemon balm

The ones people seem to use more commonly at least in some areas are marked with a star *.

Wild edible leaves. There are a very large number of these but they still need to be checked. Also many of them only have scientific names.

Some of the wild edible leaves

Portulaca	Marmar (Pisin)
<i>Commelina cyanea</i>	<i>Ficus pungens</i>
Drumstick tree	Sesbania
Indian mulberry	Tamarind
Hibiscus	<i>Alocasia lancifolia</i>
<i>Adenantha pavonina</i>	<i>Desmodium repandum</i>
<i>Piper stenocarpum</i>	Balbal (Pisin)

Edible fern fronds.

There are a very large number of ferns that have leaves that are eaten. These still need more study. Four of the more commonly used ones are:

Type of fern	Scientific name
Tree ferns	<i>Cyathea angiensis</i>
	<i>Cyathea contaminans</i>
	<i>Cyathea rubiginosa</i>
Swamp fern	<i>Diplazium asperum</i>
	<i>Diplazium cordifolium</i>
	<i>Diplazium esculentum</i>
Climbing swamp fern	<i>Stenochlaena palustris</i>
	<i>Stenochlaena milnei</i>
Kumugras	<i>Callipteris prolifera</i>

The more popular KUMUS

Aibika

This is the Tok Pisin name of a broad-leafed shrub that mostly grows about one metre tall. There are lots of different varieties of aibika. The most noticeable difference between these kinds is the shape of the leaves. But they also vary in the amount of red colour on the stalks and in other ways.

Aibika is normally planted by sticking a short length of the stem into the ground. The soil needs to be reasonably fertile and moist.

On the coast aibika grows very quickly and leaves can be picked often. It grows more slowly at higher places as the temperature gets colder. Above about 1650 metres altitude above sea level insects seem to eat it about as fast as it grows so it is less worthwhile growing. Unless aibika leaves are fried or steamed in only a small amount of water they tend to be slimy when cooked. They have a very nice taste and are very good quality food.



Amaranth

There are 6 different amaranth plants that are used as food throughout Papua New Guinea. As well as this each of these kinds can also occur with different coloured leaves so lots of variation can be found. Some kinds are planted and others just come up wild.

Amaranths are grown from seeds. Often the seed heads are allowed to dry in the garden then they are picked and stored in houses above the fire. When the owner wants to plant them they rub the seeds between their hands and let the seeds fall onto the ground. Amaranths grow best in fertile soil where there is a layer of ashes from a fire over the ground.

The seeds grow quickly. They are used either by pulling up the whole plant when it is still fairly small or by picking out the top leaves. If the top leaves are picked off this can be done several times before the plant starts to produce a seed head. Amaranths are grown throughout most of Papua New Guinea from sea level up to the highest gardens near 2400 metres altitude.

They are a very nice tasting and a very good quality leafy vegetable.



Rungia

Rungia is one of the very important Papua New Guinea green leafy vegetables that has neither a Tok Pisin nor English name. As scientists have given it the name *Rungia klossii* and this is the same in every language of the world, it is probably a good idea to call it just Rungia.

This kumu is most common in the highlands. In highland gardens it is one of the most commonly planted greens. It is a small leafy bush that often grows up to about 50cm tall. The leaves can be dark green or they can have yellow patterns on them. Several different kinds occur which have different sized leaves.

Normally Rungia is planted by sticking a few cuttings of the stems into the ground. A clump of plants then grow together. Rungia does not grow quickly but in good soil it keeps growing for 1 or 2 years. It can be picked fairly regularly over this time. Just the young leaf tips are picked off.

The leaf tips are eaten either cooked or raw. Often Rungia and highland pitpit shoots are eaten together.



Waterdropwort

This is another highland kumu without a common Tok Pisin or English name. Its scientific name is *Oenanthe javanica*. But it is not good to just shorten this to Oenanthe as there are some very poisonous weeds with this name.

It is not seen very often below about 700 metres altitude above sea level but it still grows well higher than the very highest gardens at 2600 metres.

Some kinds grow naturally near creeks and swamps while other kinds are planted in gardens. Children particularly often collect the wild plants and eat them raw.

It likes to grow in damp places and can keep growing quite well in running water. The stems are hollow.



Tu lip

Tulip is a tree of the lowland forest. It has gained the name “Tu-lip” in Tok Pisin because the leaves are produced along the branches in twos (two leaf).

The tu-lip tree is only quite a small tree although it can be up to 10 metres tall. The branches don't spread out very wide. The trees grow naturally in the lowland rainforest below about 1100 metres altitude. But it is also planted around villages.

The tu-lip tree like a lot of tropical trees has flushes of growth, so the young tender leaves which are eaten are not always equally available. But when they are ready for picking they are one of the nicest and most popular green leafy vegetables in a village.

Tu-lip trees have male and female flowers on separate trees. Female trees produce seeds that are green but turn red when ripe. These are also picked and cooked then eaten. Before cooking it is necessary to either cut the tip off the seed or crush it because it will explode when heated.

Tu-lip trees can be grown using cuttings of the branch. This allows the kinds with nicer leaves to be grown. The trees can also be grown by planting seeds.



Blackberried nightshade (Karakap)

Blackberried nightshade is a small leafy plant with flowers that look like a potato flower and groups of small black berries. Often it just comes up naturally when a new garden is cleared. The seeds seem to grow quickly and easily after an area of grassland has been burnt.

In some areas of Papua New Guinea this plant is also grown, by planting seeds. It is grown in some coastal areas and also grows naturally and is eaten in the highest gardens at about 2600metres altitude. Plants are looked after in gardens and the young tender leaves picked off and cooked and eaten.



Nasturtium schlechteri

This is another traditional kumu in the highlands of Papua New Guinea that has neither a Tok Pisin nor a common English name. Even scientists think they may have made a mistake when they named this plant. Now, by scientists, it is called *Nasturtium schlechteri* but sometime in the future this name may be changed to *Rorippa schlechteri*. Scientists have rules about how plants can be named.

This kumu is related to cabbage and to watercress. The leaves look a little bit like watercress. It has a yellow flower and short fat seedpods.

It is grown from seeds mostly just by shaking a bundle of seed heads over a fertile patch of the garden where they wish the plant to grow. It grows quickly but often gets badly eaten by caterpillars.

It has a sharp taste when eaten so is normally always cooked.

Kangkong

Kangkong is a coastal plant like sweet potato to which it is related. It has hollow stems and floats on water. Often it can be seen growing wild in the lagoons behind the sand bars along the coast. Another variety is sometimes grown on dry land and planted by seeds. The kind that grows on water is mostly grown from runners of old stems.

The young leaves of kangkong are picked and eaten. Normally they are cooked. They are a very nice tasting and a very popular kumu.

Kangkong only seems to grow well up to about 700 metres altitude above sea level.

Watercress

Watercress was brought into Papua New Guinea since Europeans arrived. But in the highlands it has already become a popular and widely used kumu.

It grows in wet places and does particularly well in shallow highland creeks.

The leaves have a slightly bitter taste so are cooked before eating. It is mostly planted by using cuttings. It has a white flower.



Chilli

Chillies have been introduced to many parts of Papua New Guinea for people to grow as a cash crop. They sell the small red fruits.

Chilli leaves are a good kumu. In many places now people grow chillies just to harvest the leaves to eat.

Often the seeds are planted but in many places the plants just come up naturally.

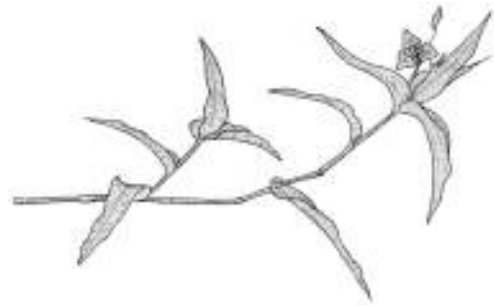


Wandering Jew

Wandering Jew is a small creeping grassland plant. It has a blue flower with 3 petals. In many parts of Papua New Guinea it just grows naturally. It is most common in damper soils. In many places it used to be planted and still is in some places.

The young leaves are picked and eaten.

People recognise different kinds. Some that prefer better than others.



Dicliptera

This highland kumu also only has Tok Ples names. In some places it is never eaten. But in other places people collect wild plants near drains and creeks and eat them. In other places still, people grow this plant in their gardens.

It is related to *Rungia* and village people sometimes call it the poor brother of *Rungia*. The leaves are longer and less shiny.

It can be grown from cuttings. The leaves are cooked.



Waterleaf

This plant has probably come to Papua New Guinea from Asia and it is still spreading around Papua New Guinea. Many people call it “Kumu Manus” in Tok Pisin because they got it from Manus Island.

The leaves are fairly long and light green in colour. They grow on a round green stem. But at the top of the stem a triangular shaped stalk is produced and the flowers and seedpods grow on it.



The plant can be grown from cuttings or seeds. The seeds fall out of the pod easily so that it is often hard to collect seed. The plant likes wet soil.

Valanguar

Around the houses of Tolai people in the Gazelle peninsula there is often a light green coloured hedge that has leaves that can be eaten. The Tolai people call it Valanguar.

It is grown from cuttings and becomes a woody bush. By picking off top leaves and pruning the branches they form it into a hedge.

This plant is also grown and used in some other places. Some people grow it as a hedge but don't eat the leaves. Some similar but different plants are also used.



Fig leaves

Lots of plants in the fig family have leaves that can be eaten. One of the most common is *Ficus copiosa*. It grows naturally from sea level up to about 1650 metres. It is also planted. It can be grown from seeds or cuttings. The fruit are small, round and in clusters on the branches. They are also eaten.

In some places these trees are planted around gardens, pruned to be like a hedge and the leaves picked off to eat.

The leaves are rough to feel and they are cooked before eating.



Highlands kapiak

Highlands kapiak is the Tok Pisin name of another fig tree. It has very large, wavy leaves and round fruits the size of a ball. The young leaves are eaten in many places and are also used to wrap food for mumus.

Mostly the trees just grow naturally but sometimes they are also planted from seed.

In some places, the young fruit are also eaten, especially by children. The tree mostly grows in the highlands between 1600 and 2700 metres.



Fig family trees usually have white milky looking sap that comes out of the plant when a branch is broken.

Basella

This dark green leafy climber has been introduced to some of the lowland areas of Papua New Guinea. It has thick fleshy leaves and pink flowers on short spikes.

It can be grown from seed or cuttings and it needs to have a stick or framework to climb up.

The young shoots and leaves are eaten. They are somewhat slimy.

It will grow up to about 1600metres altitude above sea level. At this height it only produces a short stumpy plant.

It very rarely gets insect or disease damage but gets badly damaged by root knot nematodes deforming the roots.



Comfrey

Comfrey is a low, broad-leafed hairy type of plant. It grows as a clump of large leaves with only a very short stalk. A piece of the clump is planted. It has become reasonably common throughout the highlands probably because it will grow easily even on very poor soils.

The young leaves are cooked and eaten.

Many arguments have occurred about this plant. Some people say it is very good while others say it is slightly poisonous.



New Zealand Spinach

New Zealand spinach is a low branched leafy vegetable. It is better suited to the highlands and can be grown from seeds or cuttings. Seeds are sold in stores.

The young leaves are eaten.



Cabbage

Cabbages are broad-leafed plants on a short stalk. When temperatures are cold enough cabbages form a tight round ball of leaves in the centre. Often these central leaves are pale green.

Cabbages are widely grown throughout Papua New Guinea especially in the high altitude areas above 1800 metres. They do not get damaged by frost.

Often, cabbages are grown by planting the young shoots that develop on the stalk after the cabbage has been cut off. Cabbages can be grown from seed.

Cabbages are low in food value.



Chinese cabbage

There are several different types of Chinese cabbage. In the highlands some types develop a tight central bundle of leaves. Often the plants are more open and leafy. They grow well on the coast and are fairly widely used.

Both Chinese and English cabbages often get badly damaged by insects. The caterpillars of diamondback moth, cabbage cluster caterpillar, cabbage looper and others eat the leaves.



Indian mustard

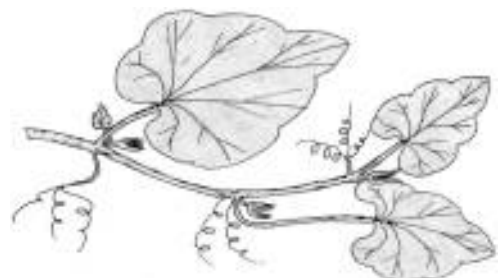
This cabbage family plant has leaves with notches around the edge but the leaves do not clasp the stem. The leaves are thin, green and slightly hairy.

It has a bitter taste and needs to be boiled twice with a change of water before being eaten.

It is not grown very widely. Seeds are used for planting.

Pumpkin tips

Pumpkins in Papua New Guinea are often more preferred for the young edible leaf tips than for the fruit. Throughout the country pumpkins are planted for their tips. In many areas these plants continue growing for several years and become almost wild plants. These naturally established plants get less mildew and disease than most of the kinds grown



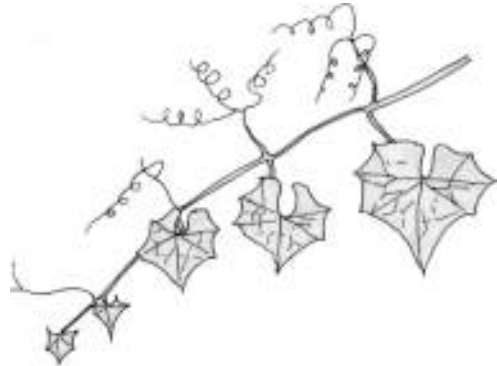
from packet seeds. People in villages have often selected kinds of plants that produce lots of tips. The tips are cooked and eaten.

Choko tips

Chokos are creeping and climbing plants in the pumpkin family. They have a fruit about 15cm long that has one large seed inside.

Chokos grow from sea level up to at least 2200 metres altitude. In the mid altitude range between about 400 and 1200 metres they are most common. In these places large areas of choko gardens grow almost continuously for many years.

Although the fruit, seed and fattened root can be eaten, it is the young tips that are most used.



Silver beet

Silver beet is a short leafy green with normally a dark green leaf on a pale shiny ribbed stalk. Blue coloured varieties also occur.

They are grown from seed and the outside leaves are broken off and cooked and eaten.

It has lots of nutrients and is a good quality green. It is reasonably common in the highlands.

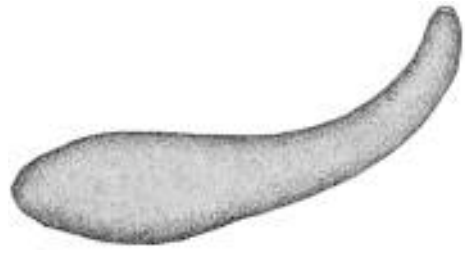


Sauropus

This is a new vegetable brought into Papua New Guinea recently. It grows as a small shrub and has small flowers hanging underneath the leaves. The leaves are cooked and eaten. It has become popular in other tropical countries where it has been introduced, including the Solomon Islands. People say the leaves are a little like “Tu lip”.

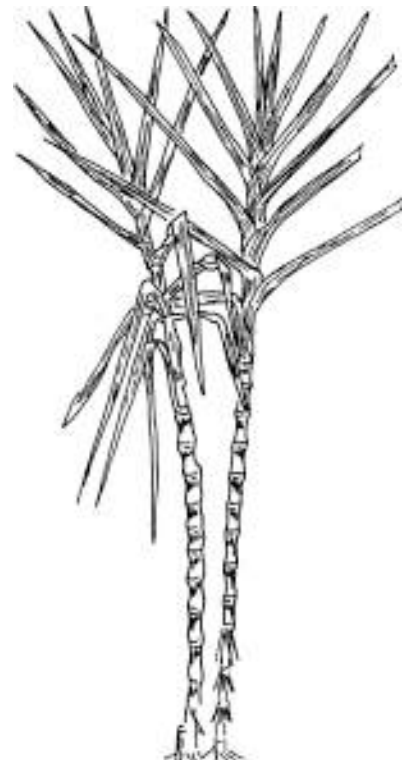
It is planted and grown from cuttings.





**Traditional and
Common**

Vegetables



VEGETABLES

It is not easy to fit food plants into food groups. Most people have a popular idea of a fruit or a nut or a starchy staple crop or a leafy green. Vegetables tend to be the other category that is left over. They are shoots, seeds, roots and fruits that are eaten with a main meal to add variety and flavour.

Vegetables (not kumus, staple crops or beans)

Coastal pitpit	Bitter cucumber	Okra
Highlands pitpit	Spring onions	Parsnip
Corn	Leeks	Carrot
Ginger	Bamboo shoots	Beetroot
Cucumber	Small bamboo	Radish
Pumpkin	Capsicums	Salsify
Choko	Tomato	Broccoli
Bottle gourd	Eggplant	Kohl rabi
<i>Tricosanthes</i>	Celery	Cauliflower
Snake gourd	Japanese radish	Turnip
Smooth luffa	Swede	Angled luffa

VEGETABLES

Bottle gourd

Most places in Papua New Guinea have a pumpkin family plant that dries out with a hard shell and is used for a container or bottle.

In some places such as the valley above Mendi this plant is a common and enjoyed vegetable.

The vines grow amongst the sweet-potato mounds and the young fruits are cooked and eaten. The leaves are also eaten.



Pumpkin

Traditional and introduced pumpkins occur in most areas of Papua New Guinea. The young leaf tips are the part most commonly used but the fruit is also cooked and eaten as a vegetable.

In many places particularly in the lowlands pumpkin vines grow naturally near banks and rubbish heaps.

Many of the introduced types suffer badly from mildew disease but the more traditional types have developed resistance to this.

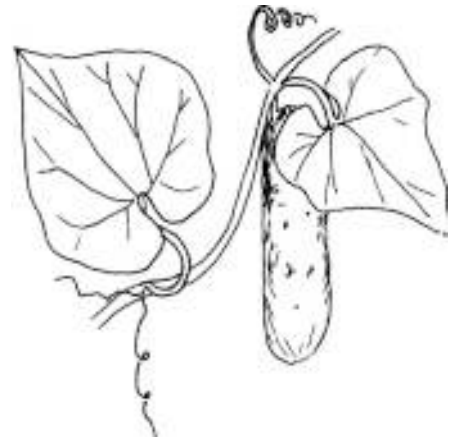


Cucumber

Cucumbers are another traditional food in Papua New Guinea. Newer kinds have also been introduced by Europeans.

Most traditional cucumbers in the Highlands have a yellowish brown skin and are oval shaped.

They are eaten fresh in the garden as one of the first refreshing foods from a new garden.



Angled loofah

The angled loofah is a pumpkin family plant that has square stems and the vine climbs up sticks. The fruit has ridges along its length.

This loofah grows quickly and is grown from seeds each year. It only occurs in the lowlands below about 500 metres.

The young fruit are cooked and eaten. The leaves are also edible.



Smooth Loofah

This pumpkin family plant has a long climbing vine. It can grow for very long distances over trees and fences.

The fruit is green and can have stripes. The outside shell becomes harder with age.

The fruit are eaten when young.



Snake gourd

This pumpkin family fruit can be very long and narrow and has a soft shell. It is often twisted and turns yellow when ripe. It often has a pattern on the surface of the fruit.

The fruit are cooked and eaten when young.

This fruit is most commonly seen in the Sepik region but grows in several coastal areas.



Bitter cucumber

This is another pumpkin family plant that grows in the lowlands. It is a slender climbing annual plant. The fruit has a lumpy appearance and is green when young and orange when ripe. Inside it is full of seeds and is bright red.

The young bitter fruits are cooked and eaten as a vegetable. The leaves are also edible.

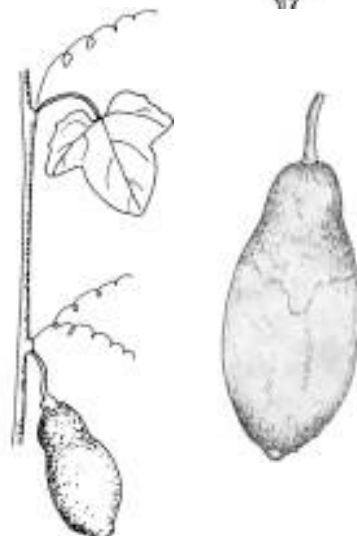
It grows wild in some areas and has also been tried as a cover crop in plantations.



Trichosanthes pulleana

This pumpkin family plant grows wild and is also cultivated in the Highlands. The fruit has an orange colour when ripe. Inside it is full of bright red flesh around black lumpy seeds. It is cooked and the flesh and seeds are eaten.

It grows on a long vine and some of the cultivated types have thick woody vines that climb trees and last for many years.



Bamboo

There are many different bamboos in Papua New Guinea and they have lots of uses. The large ones common in the Highlands with fine leaves and shoots that are eaten has the scientific name *Nastus elatus*. Most Highland houses have a clump of this near the house and the stems are used for containers.

The shoots when about 50cm long are cooked and eaten.



Small bamboo. (*Bambusa forbesii*)

This is a bamboo that grows up to about 5 metres high and has small canes about 3 cm across. Where the leaf joins the cane, there is a hairy part (ligule) that is distinctive for the plant.

In some places this bamboo is grown in gardens and takes a little over a year to produce. The shoots are cooked and eaten like a pitpit near Lake Kutubu it is common in gardens. In other places this bamboo grows wild and is only occasionally harvested and eaten.



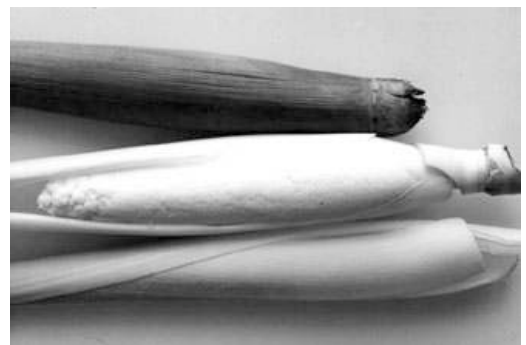
Coastal pitpit

This plant is related to sugarcane but has thinner stalks and forms a larger clump of suckers.

Flowering is seasonal and the flower and seed head fail to come out of the leaves. Instead they form a thickened edible seed head at the top of the stalk.

These pitpit shoots are a very good quality food and can be eaten raw although mostly they are cooked. A favourite way to prepare them is to cook them in coconut milk.

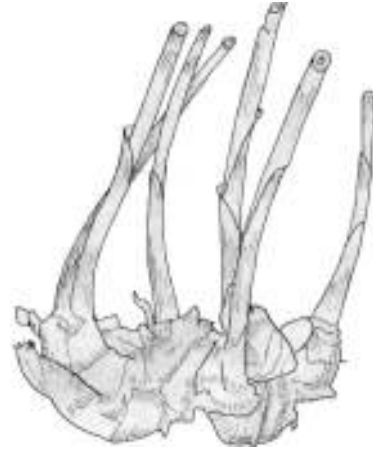
Plants are grown from cuttings of the stalk. Often they are planted in an older garden site and allowed to produce while the garden site starts returns to rainforest.

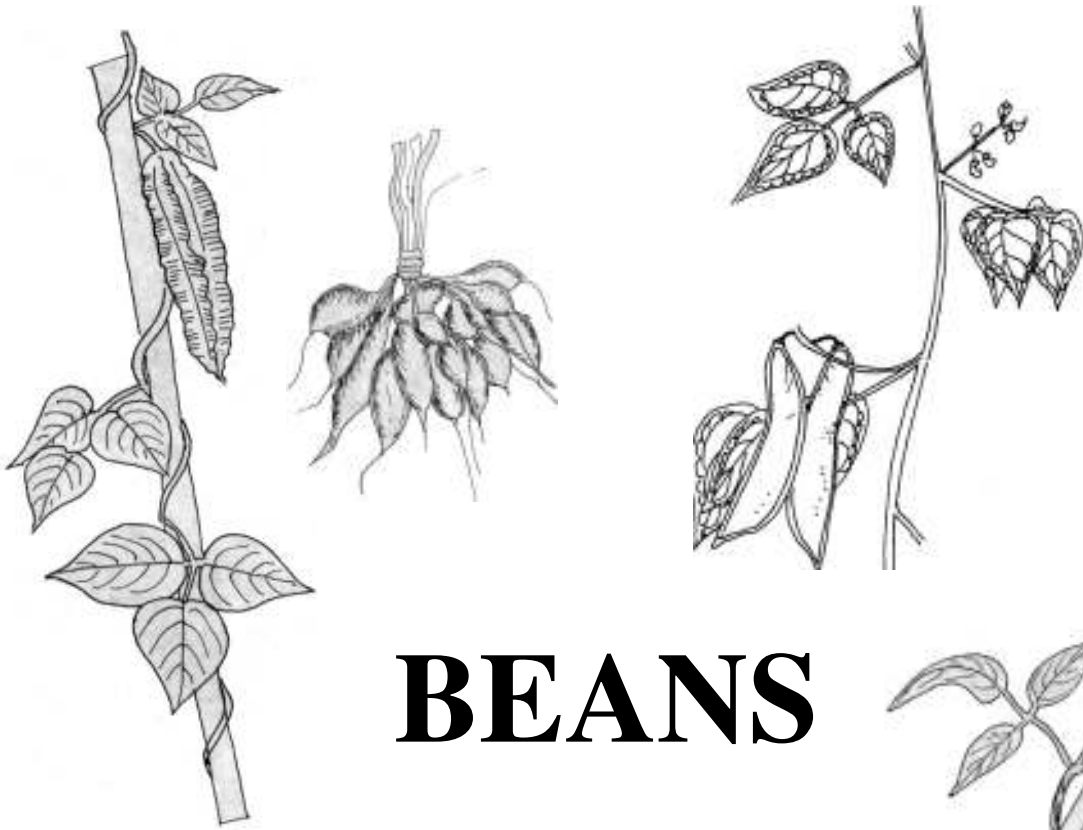


Ginger

Ginger is grown in most areas of Papua New Guinea up to about 1900 metres altitude. It often plays a role in magic as well as being a food and a spice. Ginger is eaten raw on its own as a vegetable in fairly large amounts. It is quite hot and spicy. It is also used with cooked foods.

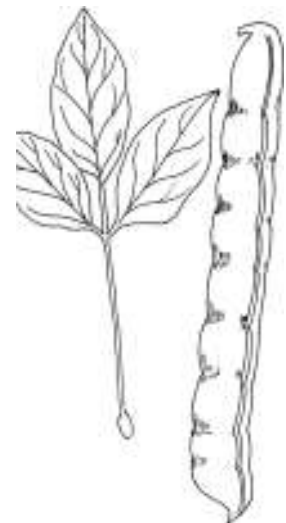
It needs a reasonably fertile soil but will grow with some shade.





BEANS

and other food legumes



Legumes used for food.

Although beans and other legumes do not make up as much of the diet in Papua New Guinea as they do in some other tropical countries, there are nevertheless quite a few legumes that are grown or used for food.

Several different parts of these legumes are used. Sometimes the leaves are eaten, occasionally the flowers are eaten, the pods and seeds are used with some of them, while others have a thickened root which is eaten.

Some of these legumes are trees while others are small annual plants.

Smaller annual type plants.

Peanuts	Soybean	Scarlet runner bean
Lablab bean	Mung bean	Kudzu
Lim bean	Green gram	Cluster bean
Common bean	Cowpeas	Chickpea
Winged bean	Rice bean	Yam bean
Snake bean	Sword bean	Broad bean
Pea	Jack bean	
<i>Desmodium repandum</i>		
<i>Desmodium microphyllum</i>		
<i>Mucuna albertisii</i>		
<i>Lathyrus tingitanus</i>		

Shrubs and trees

Pigeon pea	Tamarind
Indian coral tree	<i>Adenanthera</i>
Madras thorn	<i>Ormocarpum</i>
Mesquite	Tahitian chestnut
Raintree	Moreton Bay Chestnut
Sesbania	

Some of these plants are cultivated in gardens, others are ornamental or forest trees, while some of the plants just grow naturally in the rainforest or grassland.

Legumes are normally considered to be important for two main reasons. In the diet, legumes often supply good amounts of protein for growth. In the soil, legumes can grow where nitrogen is in short supply and some of them can release surplus nitrogen to assist other crops to grow. Special bacteria attached to the roots of legumes make it possible for these plants to produce protein and to have their own supply of nitrogen.

Names of food legumes of Papua New Guinea

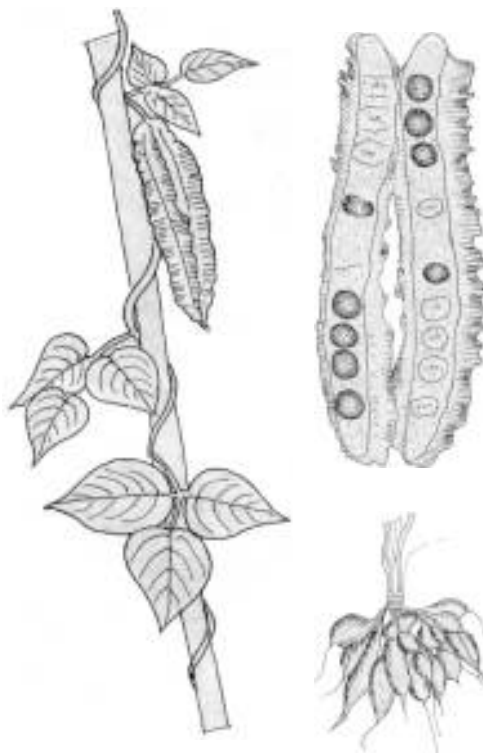
English	Tok Pisin	Scientific name
Winged bean	Asbin	<i>Psophocarpus tetragonolobus</i>
Lima bean		<i>Phaseolus lunatus</i>
Lablab bean		<i>Lablab purpureus</i>
Common bean		<i>Phaseolus vulgaris</i>
Peanut	Pinat	<i>Arachis hypogea</i>
Snake bean	Long bin	<i>Vigna unguiculata</i> subsp <i>sesquipedalis</i>
Pea	Pi	<i>Pisum sativum</i>
Pigeon pea		<i>Cajanus cajan</i>
Broad bean		<i>Vicia faba</i>
Yam bean		<i>Pachyrrhizus erosus</i>
Mung bean		<i>Vigna mungo</i>
Soybean		<i>Glycine max</i>
Cowpea		<i>Vigna unguiculata</i> subsp <i>unguiculata</i>
Rice bean		<i>Vigna umbellata</i>
Sword bean		<i>Canavalia gladiata</i>
Chickpea		<i>Cicer arietinum</i>
Scarlet runner bean		<i>Phaseolus coccineus</i>
Jack bean		<i>Canavalia ensiformis</i>
Cluster bean		<i>Cyamopsis tetragonolobus</i>
Indian coral tree	Palpal	<i>Erythrina variegata</i>
Madras thorn		<i>Pithocellobium dulce</i>
Mesquite		<i>Prosopis juliflora</i>
Raintree	Marmar	<i>Samanea saman</i>
Sesbania		<i>Sesbania grandiflora</i>
Tamarind		<i>Tamarind indica</i>
Adenanthera		<i>Adenanthera pavonina</i>
Ormocarpum	Kalava	<i>Ormocarpum orientale</i>
Tahitian chestnut	Aila	<i>Inocarpus fagifer</i>
Moreton Bay Chestnut		<i>Castanospermum australe</i>
		<i>Desmodium repandum</i>
		<i>Desmodium microphyllum</i>
		<i>Mucuna albertisii</i>
		<i>Lathyrus tingitanus</i>

Winged bean

These beans are called winged beans in English because they have wings on the pods and they are called “Asbin” in Tok Pisin because they have a thickened edible root.

They are grown from the round seeds and are a climbing bean. All parts are edible including the seeds, pods, flowers, leaves and tubers. They have large nodules containing bacteria attached to the roots. These fix nitrogen helping the plant to have a high protein content and also to restore the soil nitrogen.

They grow from the coast up to about 1800 metres altitude. Fattened roots are mostly produced between 1200 and 1800 metres. Plants for tubers are often pruned off about 1 metre tall, have some of the flowers picked off, and are also planted at a specific season.



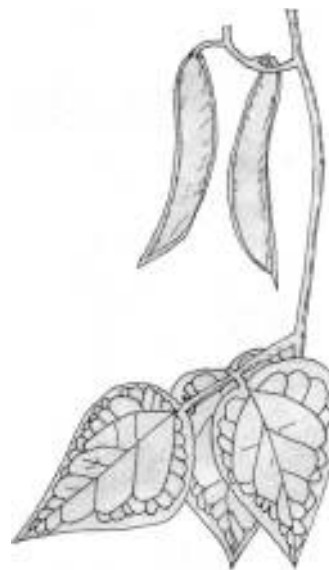
Lima bean

This is a tall climbing bean that often grows up trees. It has a pod that is often slightly curved and contains 3 or 4 seeds. The colour of the seeds can vary from white to purple.

It is reasonably common in the highlands between about 500 and 2100 metres.

The seeds should be well cooked before eating. The leaves and young pods are also sometimes eaten.

It is one of the traditional legumes of Papua New Guinea but they also occur in many other countries.



Lablab bean

This is a short climbing bean that often grows 1-2 metres high up a stick. The pods normally stick out in pairs along the flowering stalk. The plants are often purple in colour. The seeds can be white, red or black.

The young pods, leaves and ripe seeds are all eaten.

This is another traditional bean of Papua New Guinea and is more common in the highlands from 750 to 2100 metres altitude.



Common bean

This bean can occur as dwarf plants or as a climbing bean. Many kinds occur. It is an annual plant growing each year from seeds.

The pods are normally straight and have up to 12 seeds inside. The seeds tend to be oval shaped but vary a lot in colour and size.

In coastal areas this bean suffers fairly badly from root and collar rots so it is more common in the highlands especially over about 1800 metres.

The young pods are mostly eaten although the leaves and mature seeds are edible.



Peanut

Although often thought of as a nut peanut is a bean that produces its seeds underground on a long stalk.

The plant is a low bushy plant but kinds vary between being spreading and upright.

The pods contain 2-6 seeds in a hard shell. They are often eaten raw but have better food value if cooked.

The leaves can also be eaten.

Peanuts grow well from sea level up to about 1650 metres altitude.



Snake bean

In coastal areas one of the most common and popular beans is long or snake bean. It is a climbing bean with long wavy pods that can be 50 or 60 cm long.

The pods and the young leaves are commonly eaten.

In warm areas these beans grow and produce very quickly from seed.

They mostly occur below 300 or 400 metres altitude.

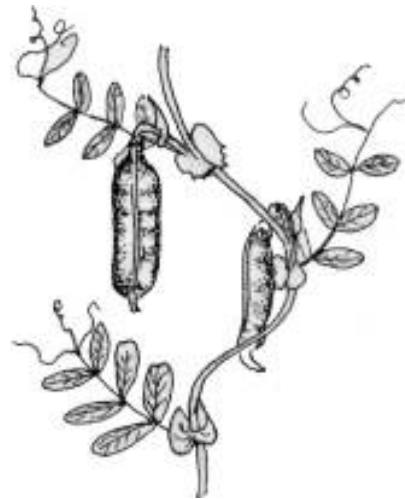


Peas

Peas are a creeping plant with more irregular shaped leaves and white flowers. The pods tend to be flattened with round green seeds inside.

It is mostly the seeds harvested from the fattened immature pods that are eaten either raw or cooked. Some kinds have edible pods and the leaves can also be eaten.

Peas do best at altitudes over 1000 metres and become more common above about 1700 metres.



Pigeon pea

This is a shrubby bush or small tree up to 2 or 3 metres high. The leaves are longer and narrower. The pods are short and stiff and contain 5-6 light brown seeds. The bush will keep growing for 2 or 3 years and if cut back will normally regrow.

Mostly the fairly ripe seeds are cooked but the leaves and young pods can also be eaten.

Pigeon pea will grow from sea level up to about 1800 metres.



Soybean

Soybean is a small bean that grows between 50 and 100cm tall. It has short hairy pods.

It has been planted and encouraged throughout Papua New Guinea because of its high protein content but it often does not grow or produce well. It grows from sea level up to 2200 metres altitude.

The young pods, ripe seeds and young leaves can all be eaten. The seeds can be germinated and cooked as bean sprouts.



Cowpea

Cowpea has often been used as a cover crop but is also a good food and grain crop. It is a creeping plant with straight firm pods.

It grows quickly and easily from seeds and occurs from sea level up to 1800 metres altitude.

The seeds, young pods and leaves can all be eaten. The seeds are also used for bean sprouts.



Rice bean

Rice bean is a short upright plant with narrow pods up to 10cm long. The seeds are small and often green, yellow or red.

It grows quickly once the seeds have germinated and suits wet climates. It grows from sea level up to about 1800 metres.

Because it suffers badly from root knot nematode damage it may not do well except in clean soil or areas that have been flooded for rice.



Broad bean

This is an upright square stemmed plant often 1 metre tall. The flowers are white with black spots and the pods are thick and fleshy with large seeds inside.

It only suits the highlands and mainly occurs between 1900 and 2700 metres altitude. Often it does not produce pods or seeds properly in Papua New Guinea.

The young seeds are the part mostly eaten although the leaves and ripe beans are edible.



Yam bean

Yam bean is a climbing bean with hairy stems and leaves that are toothed around the edge. Under the ground it produces one large white tuber that can be 30cm across and is a round fat shape.

It is the young tuber that is eaten before it becomes old and fibrous. It can be eaten raw or cooked.

The seeds, leaves and pods can be poisonous although sometimes, young pods are eaten.

It only grows near sea level and is wild and cultivated.



Mung bean

Mung or Urd beans have hairy pods and small black seeds. It is a small plant that grows quickly from seeds.

The ripe seeds are the part most commonly eaten but the young pods and the leaves are edible. This bean is grown in small quantities in some areas. The seeds are often sprouted and eaten.



Green gram bean

Often people call green gram bean a Mung bean. This one has green seeds whereas Mung bean has black seeds.

It is a small plant. It suits drier tropical areas and the seedpods are not large.

The leaves, pods and seeds are eaten after cooking. The seeds are probably the most commonly used part and these are also grown and eaten as bean sprouts.



Sword bean

This bean is often a climbing bean with 3 large leaflets. The flowers are in groups and white. The pods are long (20 cm) and curved. The seeds are red or pink and the scar where it was attached to the pod is dark brown and almost as long as the seed.



They are grown in some lowland areas up to about 1000m.

The seeds can be poisonous so should be well cooked and the water changed during cooking.



Jack bean

These beans can grow as climbers and last for a few years. The pods are long (25cm) and curved. The flowers are red or purple. The seeds are white with a scar (hilum) about half as long as the seed.

Scarlet runner bean

This is a climbing bean that suits cool climates. In Papua New Guinea it rarely grows very tall and does not produce well. In cool climates it can regrow from the fattened roots.

Kudzu

This is an old and traditional root crop where this climbing bean is grown for the very long fattened roots which are cooked and eaten.

(See also Indian coral tree and *Ormocarpum* under edible leaves, and Tahitian chestnut under nuts.)

Edible part

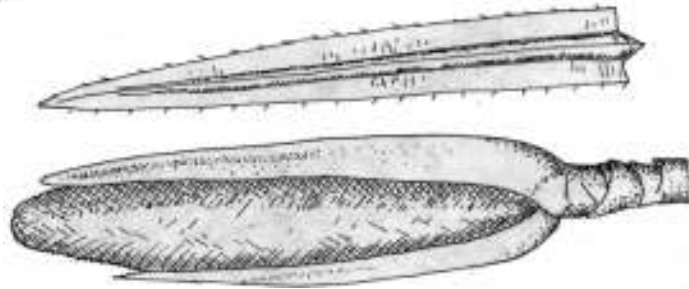
	<u>Seeds</u>	<u>Pods</u>	<u>Leaves</u>	<u>Flowers</u>	<u>Roots</u>	<u>Bean sprouts</u>
Winged bean	X	X	X	X	X	
Lima bean	X	X	X	X		
Lablab bean	X	X	X	X		
Common bean	X	X	X	X		
Peanut	X		X			
Snake bean	x	X	X			
Pea	X	x	X			
Pigeon pea	X	x	X			
Broad bean	X		X			
Yam bean					X	
Mung bean	X	x	x			X
Soya bean	X	x	x			x
Cowpea	X	X	X			x
Rice bean	X	X	X			X
Sword bean	x	X	X			
Chickpea	X	x	x			
Scarlet runner	X	x			X	
Kudzu					X	

Protein content of 100 g portion of part eaten

	Seeds	Pods	Leaves	Roots	Sprouts
Winged bean	41.9 (Mature)	2.1	5.0	11.6	
Lima bean	6.8 (Young)				
Lablab bean	3.0 (Young)	4.5			
	22.8 (Mature)				
Common bean	3.0 (Young)	2.5			4.2
	25.0 (Mature)				
Peanut	15.0 (Fresh)				
	24.3 (Dried)				
Snake bean					
Cowpea	3.2 (Young)	2.6	4.7		
	23.5 (Mature)				
Pea					



TREE FRUITS



Tree fruits

Most people have a popular idea of a fruit. It is normally soft, juicy, sweet and can be eaten. That is the kind of fruit that I intend to describe here. But some are starchy, some are sour, some are hard and some are only used for drinks. They all grow on trees and they all can be eaten.

Tree fruits that are more common and widespread

Mango *	Five corner *	Guava *
Golden apple *	Lime *	Marita *
Watery rose apple *	Pomelo *	Wild mango
Malay apple *	Lemon *	Loquat
Soursop *	Grapefruit	Mon (Pisin) *
Bullock's heart *	Mandarin	Lovi-lovi
Sweet sop *	Orange	<i>Ficus copiosa</i> *
Rambutan	<i>Clymenia polyandra</i>	Sweet banana *
Mulberry *	Ton (Pisin) *	Avocado
<i>Corynocarpus</i>		

The ones marked with a star * are probably the most widely used.

Tree fruits that are less well-known in PNG

Rose apple	Sapodilla	Elephant apple
Bilimbi	<i>Baccaurea papuana</i>	Egg tree
Jackfruit	Peach	Pomegranate
Sour Orange	Apple	Plums
Citron	Langsat	Persimmon
Kumquats	Cherry guava	<i>Ficus dammaropsis</i>
Surinam cherry	Velvet apple	Wild garcinias
Panama cherry	Governor's plum	Coffee plum
Mangosteen	<i>Flacourtia rukam</i>	Canistel
Durian	Akee	Cherimoya
Litchi	Limeberry	

Some of these fruit trees can be grown easily from cuttings. This is an easy and good method where it works satisfactorily. The ones that can be grown this way tend to be used more widely and be of better quality.

Some fruit trees produce reasonably good fruit when the trees are grown from seed. But others produce poor or sour fruit.

Fruit trees that don't grow easily from cuttings or well from seed have been slow getting accepted in villages. Other methods of starting fruit trees growing have not yet been taught to people.

Tree fruits

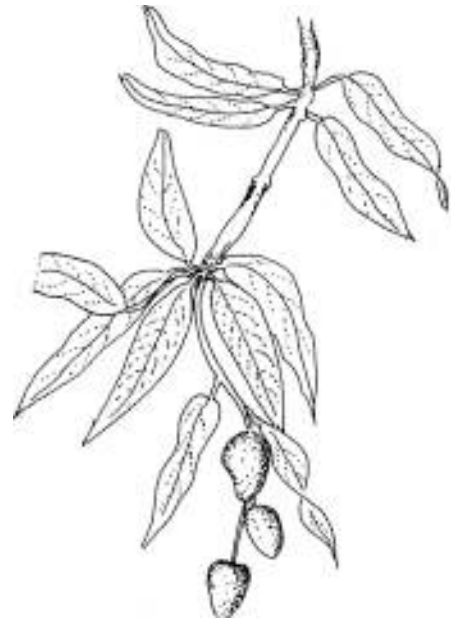
Mango

Mangoes are one of the very popular fruits of Papua New Guinea. The trees grow in many places but fruit is not often produced. This is because a disease damages the flowers and stops fruit being produced. In dry places like the Markhum Valley, Rabaul and Port Moresby lots of fruit are produced when the season is dry. The fruiting season is about Christmas.

The mango tree is a fairly large tree and can be up to 40 metres tall. Trees live for a long time.

The fruit can vary in colour between green, yellow or red. It has one large seed inside.

Most trees have been grown from seed.



Golden apple

In the lowland rainforests of Papua New Guinea there is another tree in the same family as mango. It grows wild but is also planted. It is called the Golden apple.

The tree grows up to about 15 metres tall. Leaves have saw-like teeth along the edge. The flowers are small and white and in clusters. The fruit is yellow and oval shaped. Some wild kinds have inedible fruit. The seed inside has long spiky processes on the surface.

The fruit is produced at a season. The season is about January to April. The leaves of this tree are eaten raw or cooked.



Soursop

The soursop tree is a low bushy tree that grows in the lowlands. Most trees are grown from seed.

The tree bears fruit almost continuously throughout the year. It starts bearing when about 3 years old.

The fruit can be eaten fresh or used as flavouring. The young fruit can be cooked as a vegetable.

Fruit are large and can be up to 4kg each in weight.



Cherimoya

Cherimoyas are in the same family as soursops, but they grow better in the highlands.

The tree is small, growing up to about 6 metres tall. Underneath the leaves it is a brown velvety colour.

Trees can be grown from seeds. Several trees planted near each other allow trees to pollinate each other.

Fruit are eaten raw or used for flavouring.



Bullock's heart

The Bullock's heart is another fruit in the soursop family. The fruit is reddish brown in colour.

The tree grows up to about 7.5 metres tall and fruiting is seasonal. The season is near the end of the year.

The tree is suited to the lowlands and will grow on fairly poor soils as long as they aren't waterlogged.

Trees are normally grown from seed. It is easy to transplant seedling trees.



Sweet sop

Sweetsop trees have become well established and grow wild in some of the drier lowland areas.

The tree is small growing up to about 6 metres tall. The leaves fall off the tree for a part of the year.

The fruit is covered with round fleshy scales that drop off as the fruit ripens.

Most trees are grown from seeds. Light pruning allows new branches to be produced and these carry more fruit.



Rambutan

The rambutan tree grows up to about 15 metres tall. The fruit hang in clusters. Fruit are a light red colour and have soft spiny threads over them.

These trees only grow in the lowlands and can occasionally be found up to 750 metres above sea level.

Trees can be grown from fresh seed. But the quality of the fruit varies between trees.



Litchi

The litchi is similar to the rambutan but the fruit doesn't have the hairy threads over them. The trees grow well on the coast but they don't produce fruit. They need to be at higher places to produce fruit.

Most trees are grown from seed. Litchi's are rarely seen in Papua New Guinea.

The fleshy pulp around the seeds is eaten.

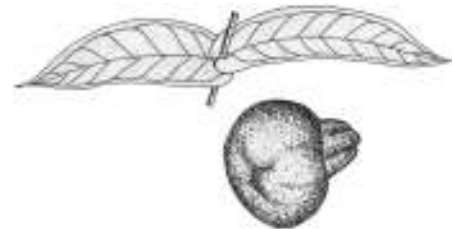


Watery rose apple

Watery rose apple is one of the fruits called "Laulau" in Tok Pisin. The fruit is bell shaped, about 3-4cm across and red or pink.

The tree is small and can be up to 10m tall. The trees grow in the lowlands from sea level up to about 1600 metres.

They can be grown quite easily from cuttings. They can also be grown from seed.



Rose apple.

Rose apple is another fruit in the laulau group. It grows on a tree that can be 10m tall. The flowers on the ends of the branches are a cluster of large yellow threads. The fruit is egg shaped and has a rose scented smell. It is a pale yellow colour. There is mostly only one (but sometimes two) seed inside a hollow centre.

It is mostly grown from seeds. One seed can produce several plants.



Malay apple

This fruit is also called laulau in Tok Pisin. The tree tends to branch near the base and can be 20m tall. The leaves are thick and shiny on both surfaces. The stamens of the flower are purple.

The fruit is red and pear-shaped. They are produced along the trunks and limbs.

Fruiting is seasonal and tends to be Dec to Feb.

Trees grow wild in the lowlands particularly in broad valley floors.
It can be grown from seed.



Five corner

The five corner or carambola has its common name because of the five angled fruit. The juicy yellow fruit grows on a small tree about 6 m high.

The tree suits the lowlands and will grow up to about 1400metres altitude.

Some trees produce sour fruit.

Trees can be grown from seeds and transplanted.

Fruit flies and fruit rot can spoil the fruit.



Lime

The lime tree is a small tree with many branches that have short sharp spines. The fruit is yellow on the outside with green flesh inside.

Trees do better in a warm coastal climate but can be grown from sea level to 2200 metres altitude.

Trees are often grown from seeds but better fruit can be produced from grafted trees.

Fruit production tends to continue year round.



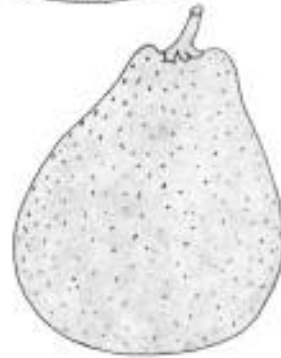
Pomelo

The pomelo is a very large fruited citrus tree. The fruit also generally have a very thick skin. The flesh inside is made up of large sacs that separate easily.

The pomelo tree is a spiny spreading tree up to 15 metres high.

It suits lowland areas and grows up to about 900 metres altitude.

Trees are mostly grown from seeds but the quality of the fruit varies.



Avocado

The avocado tree is called “Bata” in Tok Pisin because of the greenish yellow butter like flesh of the fruit.

The fruit varies between round and oval and is greenish blue on the outside. There is one large seed inside.

The avocado tree grows about 10 metres high and is damaged by frost and wind. Avocados must be planted in well-drained soil or they develop root rot and die.



Guava

The guava is a smooth barked spreading tree. The fruit are yellow when ripe with reddish pulp inside. Most trees are grown from seeds and trees grow naturally in coastal areas.

The fruit is particularly enjoyed by children. They are high in vitamin C.

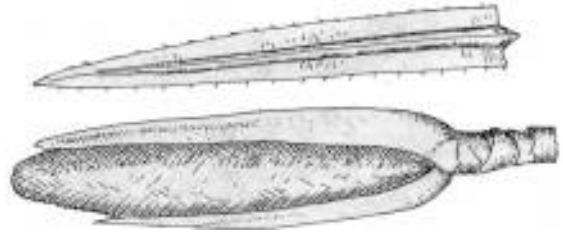
Guavas grow well from sea level to about 1600 metres although some trees are seen at higher altitudes. On the coast most trees are self-sown but at higher altitudes trees are planted.



Marita

Marita is the long red spiny fruit of a pandanus tree. The tree is a low branched, spiny tree with long straight leaves that have thorns on the edge.

The fruit are surrounded by 3 leafy bracts. When ripe it is cooked then the juice squeezed out from the pits to make a sauce. The tree is planted using suckers or from cuttings of branches.



Orange

Oranges occur in coastal areas in Papua New Guinea. Often they are seedling trees so the fruit quality varies.

Orange trees are up to 8 metres high and the leaves have narrow wings on the petioles. The fruit often remain green coloured when ripe.

They are not particularly suited to very wet areas.



Clymenia

Clymenia polyandra is a traditional Papua New Guinea fruit in the citrus family. It is grown in New Ireland and Manus.

The fruit are the size of a large lime and are yellow in colour.

At least the fruiting branches do not have spines. The fruit is sweet.

The leaves are quite large (18cm x 6cm) and simple.



Mulberry

Mulberry trees have been introduced to many areas for feeding silk worms. Mostly they are planted by cuttings and produce a small tree up to 9 metres high.

Seasonally about November fruit is produced. The berries are dark red and stain things easily. The leaves are also eaten. The berries are eaten raw; the leaves are cooked.

Mulberries are mostly grown between 700 and 2200 metres altitude.



Lovi lovi

The lovi-lovi is a small tree with a crooked trunk. It grows in New Britain and has small (2-3cm) round red fruit. The fruit are produced seasonally about the middle of the year. They are fairly sour.

Trees are normally grown from seed.



Rukam

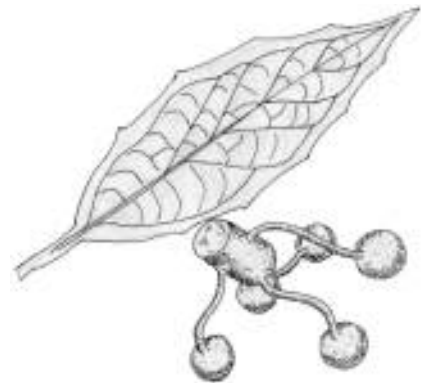
This plant is similar to lovi-lovi and has been introduced from Asia. It can grow into a large tree. The flowers are in clusters on the branches.

It grows in coastal regions.



Ficus copiosa

This is one of the common fig trees that is found throughout much of Papua New Guinea. They grow from the coast up to about 1650 metres altitude. Normally the leaves are the part most commonly eaten but the fruit are also eaten. The fruit are produced in clusters on the branches and trunk and they are green to yellow with a rough skin. They are starchy and eaten raw.

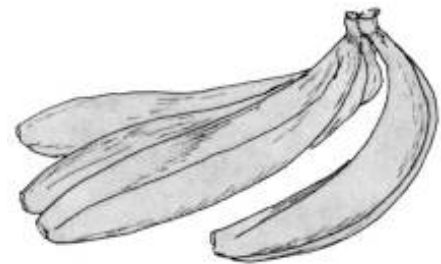


Sweet banana

Papua New Guinea has many kinds of bananas most of which are eaten as starchy additions to the staple foods.

Quite a few additional bananas have fruit that are eaten raw when ripe and many of these are sweet.

European type Cavendish and Gros Michel sweet bananas are also fairly widely spread throughout the country. The fruit are used as a snack and for baby food.



Pacific lychee (Ton)

This large tree grows in Papua New Guinea and into Pacific countries. The fruit is seasonal and the skin peels off like a mandarin. Inside there is a clear, thick fleshy layer similar to a rambutan or litchi. This is eaten fresh and enjoyed.



Mon

This large tree has a cluster of small fairly hard fruit near the ends of branches. The tree also grows in the Philippines and other places in Asia and a similar one in Fiji and Vanuatu.

It grows in lowland rainforest areas and is often seen around Madang.

The fleshy part of the fruit is eaten. It is sour. The leaves can also be cooked and eaten.



Bukubuk

This very attractive and popular fruit is mostly only seen near Rabaul. The fruit is large and has about five rounded bumps around it. Inside there is soft sweet flesh around a long black seed.

Like other trees in this plant family the branches have sticky sap if broken.

It also grows in the Solomon Islands and Vanuatu.

Trees can be grown from seed.



Pakal

This is the local language name on New Britain of a large tree in the breadfruit family that has a large brown fruit with seeds. The fruit can be 25 cm long and is irregular in shape. The seeds have a yellow layer over them.

The fruit can often be located in the bush because it develops a smell as it ripens. The ripe seeds can be eaten and the fruit can be eaten cooked.

The tree also occurs in the Philippines and Solomon Islands.

**Mundroi**

This is the Manus Island name of a fruit tree. It is a medium sized tree and has a fruit shaped like a mango. There is only one seed inside.

The fruit are used after they fall naturally from the tree. The fruit are eaten raw or cooked.

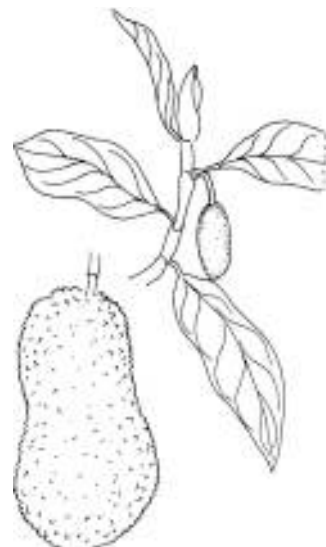
Trees can be grown from seed.

**Jackfruit**

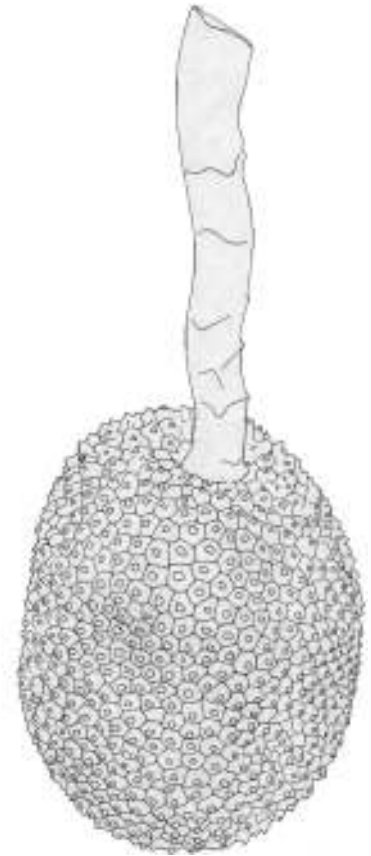
This is an Asian fruit that has been introduced to some of the lowland areas of Papua New Guinea especially along the North Coast. It grows to a very large tree and the fruit are produced on the trunk and main branches. The fruit can be very large and are spiny.

It is a plant in the breadfruit family. It is normally grown from seed and these are best planted where they are to grow without transplanting

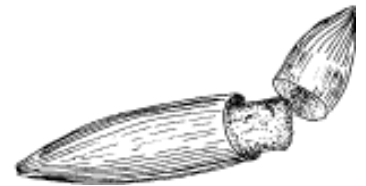
The fruit are full or large seeds and the fruit are seeds are normally cooked and eaten.



English Plant name	Tok Pisin name	Scientific name
Mango		<i>Mangifera indica</i>
Golden apple		<i>Spondias cytherea</i>
Soursop	Sapasapa	<i>Annona muricata</i>
Cherimoya		<i>Annona cherimolia</i>
Bullock's heart		<i>Annona reticulata</i>
Sweet sop		<i>Annona squamosa</i>
Rambutan		<i>Nephelium lappaceum</i>
Litchi		<i>Litchi sinensis</i>
Watery rose apple	Laulau	<i>Syzygium aqueum</i>
Rose apple		<i>Syzygium javanicum</i>
Malay apple	Laulau	<i>Syzygium malaccense</i>
Five corner	Faiv kona	<i>Averrhoa carambola</i>
Lime	Muli	<i>Citrus aurantifolia</i>
Pomelo		<i>Citrus grandis</i>
Avocado	Bata	<i>Persea americana</i>
Guava		<i>Psidium guajava</i>
Marita	Marita	<i>Pandanus conoideus</i>
Orange	Swit muli	<i>Citrus sinensis</i>
Clymenia		<i>Clymenia polyandra</i>
Mulberry		<i>Morus nigra</i>
Lovi lovi		<i>Flacourtia inermis</i>
Rukam		<i>Flacourtia rukam</i>
Ficus copiosa		<i>Ficus copiosa</i>
Banana		<i>Musa sp. (A &/orB) cv</i>
Pacific lychee	Ton	<i>Pometia pinnata</i>
	Mon	<i>Dracontomelon dao</i>
	Bukubuk	<i>Burckella obovata</i>
	Pakal	<i>Parartocarpus venenosus</i>
	Mundroi	<i>Corynocarpus cribbianus</i>
Jackfruit		<i>Artocarpus heterophyllus</i>



NUT CROPS



Nuts

Papua New Guinea has a lot of very popular nut trees. Some of these are not known outside of Papua New Guinea. Quite a few of them still need to be taken to new places within the country. But the people who have these nuts like them very much.

The most common and popular nuts

Okari nuts	Nipa palm
Galip nuts	Breadfruit seeds
Aila	Coconuts
Karuka	Finchia nuts
Wild karuka	Sis (Tok Pisin)
Castanopsis chestnuts	Tu lip
Elaeocarpus nuts	Talis
Candle nut	Java almond
Pao nuts	
Betel nut	

Less widely grown or used nuts

Coastal pandanus	Heritiera nuts
<i>Pandanus antaresensis</i>	Pecans
<i>Pandanus foveolatus</i>	Pistachio
Cashew nuts	Wild pao nuts
Kabibi	Macadamia

Other nuts that are only being tried

Peach palm	Almonds
English chestnuts	Black walnuts
Walnuts	Honey locust
Hazels	Water chestnuts

There are still a number of wild edible nuts and kernels of fruits for which information is not readily available.

NUTS

Okari nuts

Okari nut trees grow in the lowland rainforest. Mostly they are planted from seed.

The branches of these trees come out in layers and the large leaves are borne in clusters near the ends of branches.

The fruit start as angled green fruit but turn dark red as they ripen. The hard shell inside the soft flesh has holes and dents. The kernel inside this shell is eaten raw or after light cooking.

The season is about mid-year.



Canarium almond/galip

Canarium almonds grow on a large tree in the lowland rainforest. A toothed leaf-like stipule at the bottom of the leaf helps identify the tree.

The purple fruit has a thin layer of pulp and a very hard inner shell. This shell is cracked to get then kernel that is eaten.

There can be 2 or 3 seasons during a year but often the main season is mid-year.



Tahitian chestnut/aila.

The Tahitian chestnut or aila is the seed of a tree legume. The seed has lines over the surface. The seed can be 6cm across.

The seeds are roasted or boiled and eaten. Once cooked seeds will only keep a short time.

The Aila tree grows in the lowland rainforest up to about 400 metres.

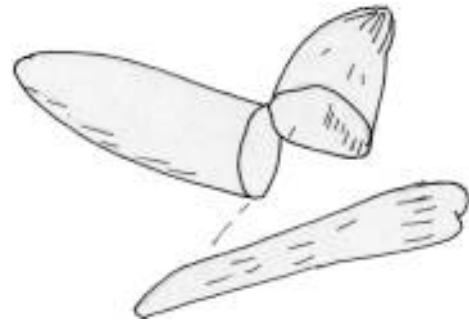
Seed are planted but trees also come up naturally from seeds distributed by bats.



Karuka

Karuka is the Tok Pisin name of a palm like tree that is planted in the highlands. The leaves are long have thorn along the edge and are at the top of the fairly straight trunk.

During the season a large round cluster of nuts tightly packed in a head is produced at the top of the tree. This is made up of about 1000 nuts each contained in a shell. The kernel inside the shell is eaten.



Wild karuka

Wild karuka is a similar tree to karuka except that it grows naturally and is higher up in the mountains. The ends of the leaves do not bend over like in karuka. Also the end of the nuts is longer and pointier. The shells are harder.

These nuts are often harvested after they fall.

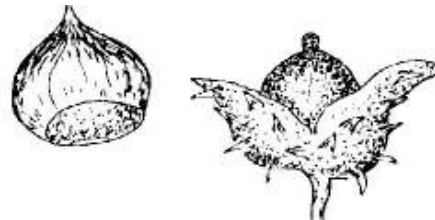
Both karukas can be grown from seed or cuttings of branches.



Castanopsis chestnuts

Castanopsis chestnuts grow in many areas of Papua New Guinea. The trees grow naturally and are also planted.

In season the small nuts are collected in large numbers and boiled. They taste like rice.



Elaeocarpus nuts

Elaeocarpus nut trees mostly grow in the mountain regions. The tree is large with a thick trunk. The fruit fall and are then harvested.

The flesh inside the fruit is green. Inside this there is a nut with a lumpy surface. The shell is fairly hard to break but inside is the kernel that is eaten.

Trees normally only grow wild from seed. Fruit production is seasonal.

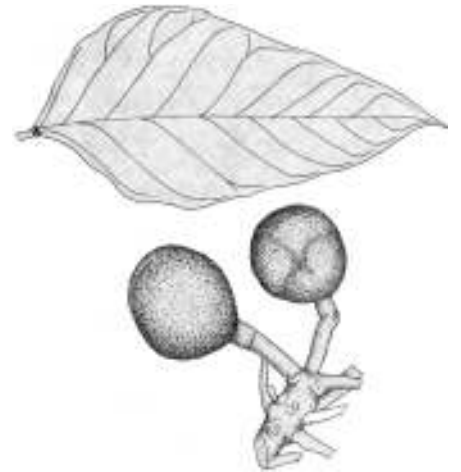


Candle nut

Candle nuts grow on a fairly large tree in the lowland rainforest. The leaves of the tree often have a silvery appearance.

The fruits are about 5 cm across and are produced in clusters. Inside it has between 1 and 3 large seeds with a thick-ridged shell.

Because the nuts can contain poisonous substances they should be roasted before eating. The nuts have a large amount of oil and will burn. That is why they are called candle nuts.



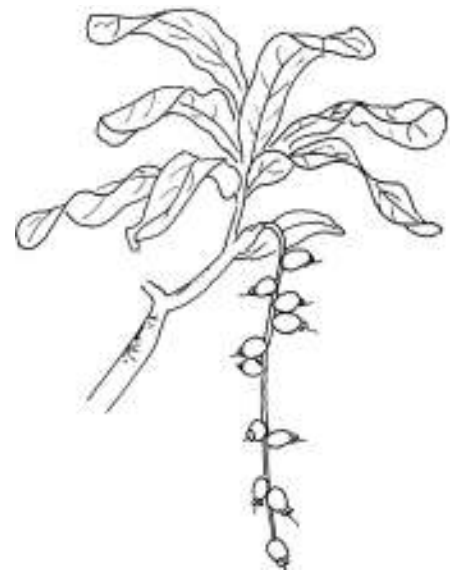
Pao nuts

Pao nuts grow on a small tree. The tree produces a long cluster of nuts. The outside of these is mostly blue.

The leaves of the tree are quite large. The tree has a number of spreading branches near the top of the tree.

Pao nuts grow in coastal areas up to about 600 metres above sea level. They occur particularly in the New Guinea islands and along the North Coast of the mainland.

The kernels inside the nuts are eaten either raw or roasted.



Betel nuts

Betel nut is the most common chewing material in the world. It is normally chewed with lime and a spice such as betel pepper.

The nuts are produced in clusters on a thin tall palm that grows in the lowlands. A similar palm that grows in the highlands has a nut called “Kabibi” in Tok Pisin.

The outside of the fruit is fibrous and the nut inside varies in hardness with age.



Nipa palm

In swamp areas around the coast the nipa palm produces a round cluster of nuts. The kernel inside them can be eaten.

Nipa palms grow naturally in swamps and mud along the coast. The trunk of the palm lies along the ground in the mud. The leaves do not have spines.

A very large knobbly bunch of nuts grows on a stalk that curves up near the end of the palm.

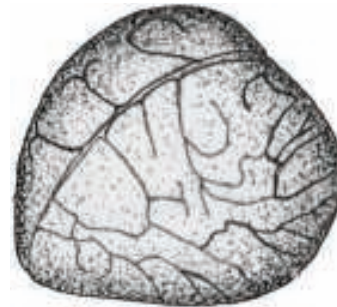


Breadfruit seeds

On the Western half of the mainland of Papua New Guinea breadfruit is mostly grown for the seeds. The fruit that is full of seeds has spikes over the surface of the fruit.

A seed is about 4cm across and weighs about 5 grams.

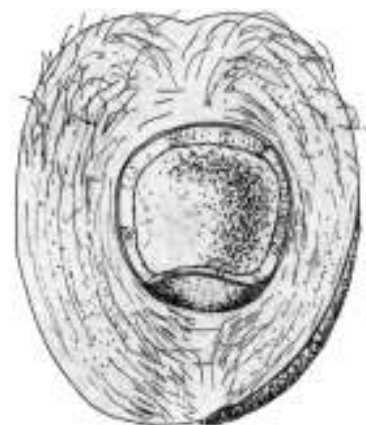
The seeds are lightly roasted then eaten.



Coconuts

Coconuts are popular and well known in all coastal areas. They have many uses for drinks, soft flesh, cooking and other edible parts.

But as the nut matures the liquid inside the nut gets less and the white layer around the nut thickens and hardens. This thick white layer is eaten raw. It tastes like a young karuka nut.



Finschia nuts

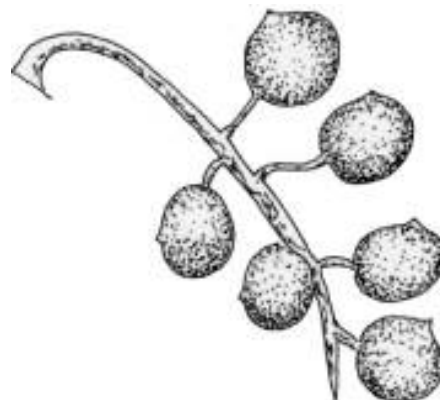
Finschia nut trees can bear nuts when very small or may grow into medium sized trees up to 25 metres tall. Three different but related kinds of Finschia nut trees occur in different areas of Papua New Guinea.

The tree produces a cluster of nuts sometimes near the bottom of a leaf but sometimes just along a branch.

The flower is greenish yellow and so is the fruit.

They grow in lowland rainforest up to about 1800 metres altitude.

The small kernels of the nuts are eaten.



Sis seeds

The Sis (Tok Pisin) fruit is a large fruit with a rough skin. Inside there are several large red seeds, in a yellow strong smelling flesh. The shells of these nuts are often used for necklaces and rattles.

All parts of the Sis tree are poisonous. Therefore the seeds must not be eaten before processing. The seeds are made not poisonous by roasting them, washing them for a long time in running water, then fermenting.

The tree often grows near creeks in the lowland rainforest.



Tu lip seeds

The tu-lip (Tok Pisin) tree is one of the very popular trees for edible leaves. It grows in the lowlands up to about 1100 metres above sea level.

The small fruits are also eaten. When they are ripe they are either crushed or the tip end cut off then they are roasted and eaten.

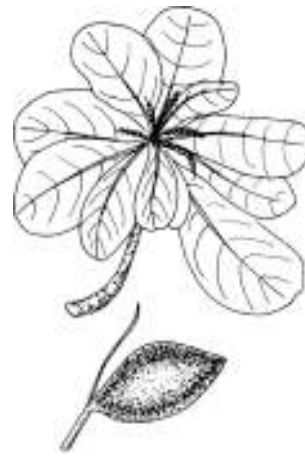


Coastal almond

This tree with its large leaves and spreading branches grows on almost every beach in every tropical country of the world.

The fruit are flat and with wings. Inside the green flesh is a hard shell with a small edible kernel. This nut is very rich in zinc needed by young children to grow well.

It is good that children enjoy sitting on beaches cracking open the nut on the rocks.

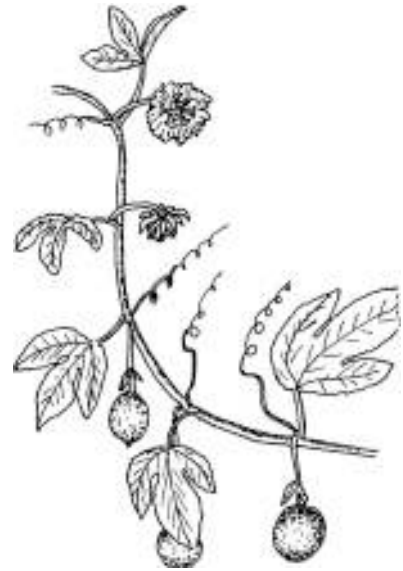
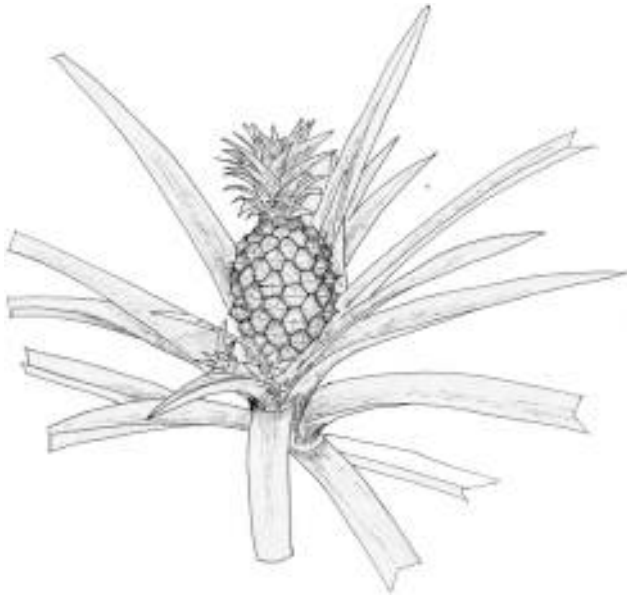


Galip

Several nuts are called galip in Tok Pisin. One common tree in the lowland rainforest is a large tree with branches that spread out horizontal to the ground and is like Okari and Coastal almond. It has edible kernels inside the nuts.



English Plant name	Tok Pisin name	Scientific name
	Okari	<i>Terminalia kaernbachii</i>
	Galip	<i>Terminalia impediens</i>
Coastal almond		<i>Terminalia catappa</i>
Galip	Galip	<i>Canarium indicum</i>
Tahitian chestnut	Aila	<i>Inocarpus fagifer</i>
Karuka	Karuka	<i>Pandanus julianettii</i>
Wild karuka	Karuka	<i>Pandanus brosimus</i>
Chestnuts		<i>Castanopsis acuminatissima</i>
Elaeocarpus nuts		<i>Elaeocarpus polydactylus</i> <i>Elaeocarpus womersleyi</i>
Candle nut		<i>Aleurites moluccana</i>
Pao nuts	Pao	<i>Barringtonia procera</i> <i>Barringtonia novae-hibernae</i> <i>Barringtonia niedenzuana</i>
Betel nut	Buai	<i>Areca catechu</i>
Wild betel nut	Kabibi	<i>Areca macrocalyx</i>
Nipa nuts		<i>Nipa frutescens</i>
Breadfruit seeds		<i>Artocarpus altilis</i> var. <i>seminifera</i>
Coconut		<i>Cocos nucifera</i>
Finschia nuts		<i>Finschia chloroxantha</i>
Pangium	Sis	<i>Pangium edule</i>
Tu-lip seeds		<i>Gnetum gnemon</i>



Fruit from bushes vines and shrubs



Pineapple

The main 2 types of pineapple are the thorny and the smooth leafed kinds.

Pineapples can be grown from suckers, slips or the tops of the fruit. The suckers near the bottom of the plant are the best.

The fruiting of pineapples is controlled by the time of year. It is possible by adding chemicals to get fruit all year round.

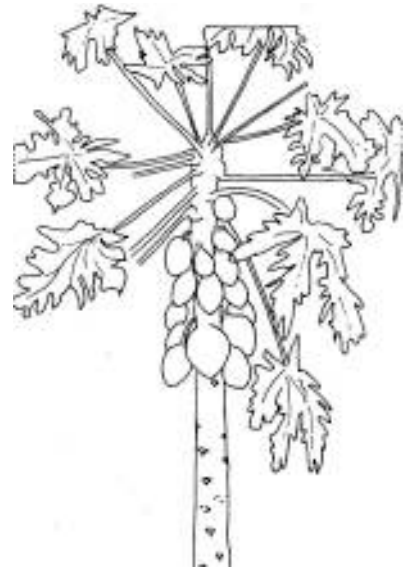
Pineapple plants turn red when they are short of the nutrient nitrogen.



Pawpaw

Pawpaw fruit vary in shape because trees can be female with round fruit, have both sexes and produce long fruit or be male and have flowers but no fruit. For the long fruit some fruit can be smooth and even while others are bent or have ridges along them. They all taste nice! Where long fruit occur, the male trees with flowers only can be cut down, as there is pollen in the flowers of these long fruited kinds. If only round fruited kinds occurred, male trees must be left to provide pollen.

Pawpaws grow in most of the lowland areas of PNG and often come up naturally when rainforest is cleared because the seed have been spread around, by birds and bats.



Naranjilla

This small bush with large soft leaves has been introduced from Central America. It will grow in the lowlands and in the main highland regions where it is still warm.

Plants are grown from seed and the fruit are softly hairy but these can be rubbed off.

The fruit can be eaten raw.



Tree tomato (Tamarillo)

These small tree-like shrubs are grown in the highlands. The plants originally came from South America. From the branches that stick out sideways, there are clusters of fruit. These are egg shaped and become red and look a little like tomatoes. They can be eaten raw.



Rosella

In some coastal areas this Hibiscus-like plant grows as a small bush. The flowers are yellow and like a Hibiscus or Aibika flower.

The flowers develop fattened red bracts and these are what is eaten. These red bracts can be very easily made into a jam by boiling them for a sort time with some sugar.

Plants are easily grown from seed.



Raspberries

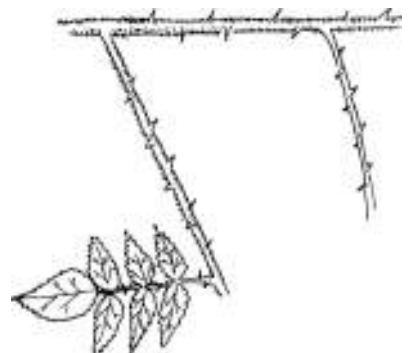
There are several traditional raspberries in Papua New Guinea. Often the fruit do not have a lot of taste and are mainly eaten by children or as snacks while walking in the bush.

Red raspberry

There are about 3 different small straggly bushes that have red raspberries on them.

Black raspberry

This raspberry has a long spiny cane that is usually white in colour. The fruit are black.



Watermelon

Watermelons are common and popular in the very hot, dry sandy areas especially around Port Moresby.

They creep over the ground and develop large green or mottled fruit. These have red flesh with black seeds inside. Several different shapes and colours of fruit occur. The fruit are cool and refreshing on hot days.



Cantaloupe and Rock melon

These are vines in the pumpkin family. They creep over the ground.

In wet places in the tropics these plants often suffer with damage from mildew fungi.



Passionfruit

Purple passionfruit has been introduced and grown as a cash crop in the highlands. There is a yellow form with smoother skin that will grow in the lowlands.

There are many passion fruit species in Central America and some other ones such as yellow granadilla may also occur in Papua New Guinea.

They can be grown from seed or by cuttings. The vines climb over trellises and fences.



Passionflower

This small creeping plant often grows wild in open places and in grassland. The fruit are small and round and turn yellow as they ripen. They are enclosed in a frilly covering that is taken off.

It is mostly only used as a snack when people are walking and is enjoyed by children.



Granadilla

The granadilla plant is like a large passionfruit plant. The stems are more soft and green and have angled stems. They can grow very long climbing over fences and into trees. The fruit are large and oval with white flesh inside.



Banana passionfruit

This passionfruit vine can be very large. In high altitude places it now grows wild growing over the top of the rainforest trees. This is seen in high altitude places above 2600 m altitude where people go to harvest their wild karuka.

The fruit is long and turns yellow and has sweet flesh amongst the seeds inside. It can be eaten raw.



Cape gooseberry

This small plant in the tomato and potato family has furry leaves and grows as a small bush.

The fruit are enclosed in a papery covering that dries out and is removed. The fruit are small and round and become yellow when they are ripe.



English Plant name	Tok Pisin name	Scientific name
Pineapple	Painap	<i>Ananas comosus</i>
Pawpaw	Popo	<i>Carica papaya</i>
Naranjilla		<i>Solanum quitoense</i>
Tamarillo		<i>Cyphomandra betacea</i>
Red raspberry		<i>Rubus rosifolius</i>
Black raspberry		<i>Rubus moluccanus</i>
Watermelon		<i>Citrullus lanatus</i>
Cantaloupe		<i>Cucumis melo var. cantalupensis</i>
Passionfruit purple		<i>Passiflora edulis</i>
Passionfruit yellow		<i>Passiflora edulis f. flavicarpa</i>
Passionflower		<i>Passiflora foetida</i>
Granadilla		<i>Passiflora quadrangularis</i>
Banana passionfruit		<i>Passiflora tripartita var. mollissima</i>
Cape gooseberry		<i>Physalis peruviana</i>