

A black and white photograph showing a large quantity of harvested root and tuber crops. In the foreground, several bundles of ginger are visible, each consisting of a thick, knobby root with several long, pointed ginger stalks growing from the top. The bundles are tied together with thin, light-colored bands. In the background, other types of tubers, possibly sweet potatoes or similar root vegetables, are scattered on a light-colored surface, possibly a market stall or a drying area. The overall scene depicts a busy agricultural or market setting.

**ROOT AND
TUBER CROPS**

Plants with edible roots and tubers, as we have seen, are those around which the agricultural cycle is centred. Taro and yams have been in Vanuatu since ancient times; sweet potato and cassava are introduced. But all form the basis of a ni-Vanuatu meal. Breadfruit and banana, plants with equally ancient ancestry, are also energy-providing

foods that are regularly eaten. But the first of these is a tree and the second a herbaceous plant, so they are treated in different sections of the book. Some of the plants covered here are no longer eaten except in times of food shortage, such as *Pueraria* and *Cordyline*, but in earlier times they were important food plants of the first Oceanians.

Genus

Alocasia

Family

Araceae

The genus comprises about 60 species spread from South Asia to the Pacific islands and Australia. Many species are ornamental.

Species present

Alocasia macrorrhiza (L.) Schott.

Alocasia, elephant's ear, giant taro

Alocasia, a wild plant in Vanuatu, is sometimes cultivated in the gardens. But it is mainly a plant used in times of food scarcity, situated in moist places but not in free-standing water, whose sweet cultivars are sought after.

References

Bradbury & Holloway (1988), de Candolle (1883), Christophersen, ed. (1971), French (1986), Glassman, ed. (1971), **Hay (1990)¹⁰**, Ivancic & Lebot (2000), Neal (1929), OMS (1998), Pétard (1986), Plucknett (1970), Purseglove (1988), Simmonds, ed. (1984), Weightman (1989), Wilson *et al.* (1988), Yuncker, ed. (1971, 1974), Zeven & de Wet (1982).

Plant used in times of food scarcity or famine, local

Alocasia macrorrhiza

Alocasia, elephant's ear, giant taro

History

The plant, originally from mainland Southeast Asia, Sri Lanka and India, has been cultivated since ancient times in tropical regions from Myanmar to Papua New Guinea and northern Australia. Subsequently it was spread by humans to all the islands of

Oceania, as far as Polynesia, Hawaii and Japan. La Billardièrre, during his voyage of research with La Pérouse, observed it in a cultivated state in New Caledonia. Later it was also introduced to tropical America. In Vanuatu it was introduced by humans in ancient times, but it is little cultivated because of abundant crystals of calcium oxalate contained in its **corn**, which irritate the throat. It is a minor crop except in the islands of the central Pacific (Samoa, Tonga, Wallis and Futuna) where it is grown in abundance.

¹⁰ A reference in **bold type** indicates the latest revision of the genus or the most recent that we were able to consult.

Description

Large herbaceous plant reaching 4 m in height. Long corm (20 cm in diameter and from 8–40 kg), cylindrical, concave, rising out of the soil for a height of a metre or more. Leaves erect, sagittate, oval, green, sometimes tinged with purple especially in cultivated forms, 1 m long; margins undulate; veins prominent; **petiole** longer than 1 metre. Inflorescence consisting of a **spadix** containing female flowers at the base and male flowers towards the tip; a sterile appendage that is as long as or longer than the section of male flowers. Fruits in a cluster, red; long **peduncle**; one to two seeds.

Morphological variability

The wild forms are not edible because of the presence of calcium oxalate. The forms cultivated for consumption contain little of this because they are the result of continual selection in favour of sweet **morphotypes**. Among these last, there are forms with a green petiole and others with a petiole tinged with purple or with grey, and forms with a red or a white corm. Populations that cultivate alocasia regularly, such as those of Samoa, Ponape, Niue and Tonga, have selected several varieties. In Vanuatu

most cultivars are found on the island of Ambae. But the better varieties have been introduced by Wallisians working in plantations during the era of the Condominium of the New Hebrides.

Cultivation and production

Alocasia is generally found in a wild state on banks of rivers and in places that are wet but not marshy because the plant dislikes excess water. When cultivated it is planted in dry soil to the top of the corm or the lateral shoots, spaced about 2 m apart. In Vanuatu alocasia is essentially a wild plant, but some communities such as those of Pentecost or Forari (Efate) grow a few stands in their gardens. It reaches maturity after about a year, but is harvested after two or three years and may be kept for over four years in the soil. The yields are impressive and regularly reach ten or more kilos per plant. No serious diseases or insect pests are known, but wild pigs may cause damage. It tends to expand in areas where the taro beetle (*Papuana* spp.) infests taro, because its solid corm situated above the soil is never attacked. With the increase in pressure on land, its cultivation is likely to increase in places such as Tonga, Samoa and Wallis and Futuna.

Alimentary uses

This is, at least in Vanuatu, a minor food crop that is also fed to pigs. However, the Wallisian community settled at Forari on the east of Efate regularly produces for its own consumption some very good, sweet cultivars that can occasionally also be found in the Port Vila market. *Alocasia* may be cooked with care in an oven of hot stones in order to eliminate the crystals that spoil the taste.

Other uses

The plant is used for medicinal purposes in Fiji and Papua New Guinea, but does not seem to have any such use in Vanuatu. Its large leaf is often used as an umbrella when an unforeseen rainstorm catches walkers unaware. A corrosive sap flows from the cut stem, and care must be taken to avoid letting this come into contact with the skin.

Genus

Amorphophallus

Family

Araceae

The genus comprises about a hundred species spread in Africa, the Indo-Malayan region and Australia. Vanuatu possesses one species.

Species present

Amorphophallus campanulatus (Roxb.) ex. Decne

Elephant foot yam

This ancient plant is little cultivated and therefore little eaten. But the wild forms are foods in times of famine, still used nowadays after a long period of preparation.

References

Barrau (1962), Christophersen, ed. (1971), **Hay (1990)**, Hedrick (1972), Henderson & Hancock (1989), Ivancic & Lebot (2000), Ochse & Bakhuizen van den Brink (1980), Pétard (1986), Purseglove (1988), Sastrapradja *et al.* (1984), Weightman (1989), Zeven & de Wet (1982).

Food in times of famine, local

Amorphophallus campanulatus

Elephant foot yam

History

This strange plant came a very long time ago from mainland Southeast Asia. It is found in the wild state in Java and in the Philippines, and in a spontaneously generated form in the Pacific islands; it is cultivated in Java, Papua New Guinea and Solomon Islands, and sometimes elsewhere. Its huge inflorescence is evil-smelling. The wild forms contain crystals of calcium oxalate

which stop their consumption, but the rare sweet cultivars are very much appreciated by Asian consumers. Oceanians also grow some sweet forms of this species, quite low in oxalate. Nowadays its cultivation has almost disappeared, and its huge corm is only eaten in times of famine. The exact time of its introduction to Vanuatu is not really known, but there as elsewhere it is a spontaneously generated plant that is never cultivated.

Description

Single leaf (sometimes double), erect, composite, deeply lobed, with three main divisions each of which is then divided into

multiple, elongate segments, pale green; long (50 cm) and thick petiole, rugose and often spiny, greenish-grey or purplish, dotted with little whitish markings. When the leaf falls the inflorescence appears. This is a spadix 20–25 cm long comprising in order from bottom to top cylindrical female flowers, conical male flowers, and then a sterile appendage that is spongy, phallic, crumpled and adorned with purplish grooves. The stink of the inflorescence is reminiscent of rotting carrion, and it attracts flies. As it ages the **spathe** folds back to form a collar with wavy edges, yellow at the base and purplish at the apex. Numerous fruits stuck one to another, the size of small peas, red, 1 cm in diameter; peduncle erect. Seeds **polyembryonic**. Corm in the shape of a thick disc with a central depression, reddish-brown, irritant to the skin when it is young, 20–25 cm in diameter and can weigh up to 15 kg.

Morphological variability

There exists a wild form that cannot be eaten, which has a massive and very corrugated petiole, and a cultivated form that is edible and has a smoother petiole.

Cultivation and production

This plant is very rarely cultivated in Vanuatu. It may be seen in areas of fallow, shady places, pastures under coconut, and

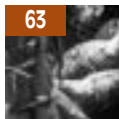
more generally in any place that suffers seasonal dryness, from sea level to 800 m altitude. The sweet forms are multiplied using small secondary corms, or cormelles, which are planted in fertile and well-drained soil. The corm, mature after about five months when the petiole falls, remains for several months in the ground. It is harvested after three years. The small shoots are used either for propagation or for food.

Alimentary uses

Only the cultivated form is eaten, and this only rarely. In case of absolute necessity the wild forms can be used, but at the expense of very careful preparation in order to eliminate the oxalate crystals that irritate the throat. Corms of small size are cooked. They are cut into pieces which are then **retted** (steeped in water) for a long time. Then they are baked in an oven of hot stones or boiled for ages. The cultivated form does not need retting, but must still be baked for a long time in the hot stone oven. This food, which was doubtless eaten regularly in earlier times, is nowadays only a food during famines, eaten by a few communities such as in Tanna and Santo.

Other uses

The sap of the plant is irritant, and the early Samoans whipped unfaithful wives with the leaves.



Genus

Colocasia

Family

Araceae

The genus contains seven species of which only one, *Colocasia esculenta*, is an important food plant. It is the only one present in Vanuatu.

Species present

Colocasia esculenta (L.) Schott.¹¹

Taro

Taro, together with yam, is one of the two major food plants of Vanuatu. It is grown in every island, rainfed and irrigated. It is always served at feasts, and is harvested after a year.

References

Bown (2000), Bradbury & Holloway (1988), **Hay (1990)**, Ivancic & Lebot (2000), Lebot (1992), Lebot & Aradhya (1991), **Matthews (1990)**, Plucknett (1984), Wang (1983), Yen & Wheeler (1968).

Staple food plant, local

Colocasia esculenta

Taro

History

Taro originates from the Indo-Malayan region between Myanmar and Bangladesh. From there it spread eastwards to Asia and the Pacific and westwards to Madagascar and Africa, and then the West Indies and America. Recent research has built on this classic scenario. The area of distribution of this species in the wild state is much larger, and extends from Myanmar to Papua New Guinea and northern Australia, astride the two conti-

ental plates of Sahul and Sunda. It has certainly been domesticated for several millennia on one or other of these continental plates, i.e. in Southeast Asia and in Papua New Guinea. This domestication since ancient times has led to *Colocasia esculenta* having thousands of cultivars, some of which are unique to the Pacific. The distribution of the Oceanian forms, from Papua New Guinea to Polynesia, is poorly understood, however. But it is noticeable that all the Oceanian forms show quite narrow genetic variability, even more so when one looks at those of Polynesia. Thus, the genetic variability of taro in Vanuatu is less than that of Solomon Islands or Papua New Guinea, but more important

¹¹ The name taro is also applied – incorrectly – to other closely related plants that are used in the same manner (see pp 59, 69, 106).

than that of Polynesian taros. In Vanuatu, forms are found that flower naturally and even produce seeds spontaneously.

Description

Herbaceous plant 1–1.5 m in height. Subterranean stem (corm) **globular** to cylindrical, variable in size; epidermis smooth or scaly; flesh more or less fibrous, white, pink, yellowish, mauve or violet. Leaves **peltate** and **cordate**, light green to dark purple, 30–80 x 20–50 cm; petiole thick, variable in size and colour, uniform, speckled or striped.

Morphological variability

According to botanists, taro is a single species that encompasses two major varietal types, known under the names of Dasheen and Eddoe (or Eddo). Dasheen (derived from the French *de Chine* meaning “from China”) have a large central corm surrounded by small lateral corms that are hardly developed; Eddoe has a small central corm surrounded by lateral corms that are well developed. Eddoe does not occur in Vanuatu. The morphological variability is nevertheless very important in Vanuatu, depending on the size and shape of the corm, the size and colour of the leaf and the petiole, the texture and colour of the corm, and the presence and number of **stolons**. Over 500 different morphotypes have been distinguished. The cultivars are recognised also on **organoleptic** criteria, which the farmers take



Colocasia esculenta

into consideration when building up their personal collections. Certain taros in Vanuatu appear to be spontaneous wild forms, perhaps present on the islands before the arrival of humans. It may thus be that the remarkable variability found is of ancient origin, and results both from recombination through sexual reproduction, although this is rare, and selection of **somatic** mutations that are certainly more frequent.

Cultivation and production

Taro likes humid areas, and it is therefore dominant on the windward sides of islands and at altitude. It is also cultivated in water in the extremely sophisticated, irrigated taro gardens discussed earlier, that may be situated in leeward zones such as on the west coast of Santo and Maewo. It is these irrigated taros that produce the highest

yields, in the order of 60 tonnes per hectare per year, while the yields in the rainfed gardens vary from 15–30 tonnes.

Taro is above all cultivated for the swollen base of its stems. Unlike with other root crops, it is best to plant suckers or the crown of a corm at the bottom of a hole about 20–30 cm deep, where it will find the humidity that favours its vegetative increase during the first six months of its cycle. During the phase when the corm fills with starch, the above-ground part of the plant declines in vigour and in height in proportion to the swelling of the corm. The farmers know this phenomenon well and still maintain their gardens appropriately. The main pest is the taro beetle (*Papuana* spp.), which has a great taste for the corm and can ruin an entire taro crop. It is desirable to make some judicious rotations in order to control them. In Vanuatu no serious virus diseases are known, though Dasheen Mosaic Virus (DMV) is present.

Alimentary uses

Taro is, together with yam, the staple food of the ni-Vanuatu. It is prepared in numerous ways. It may simply be baked with a hot stone and then eaten hot or

cold, or it may be cut into pieces and boiled. Above all it is used to prepare lap-lap, by grating the corm to a puree and wrapping this in an envelope of leaves and cooking in an oven of hot stones. Certain cultivars are too soft to be suited to this form of preparation. Others that contain crystals of calcium oxalate are sooner broiled on a hot stone or glowing embers. The young leaves of taro are eaten as vegetables, mixed with other leaves and often sprinkled with coconut milk. Finally, at the time of flowering the flowers are picked and cooked in small bamboo containers. Sprinkled with coconut milk, they make a delicious accompaniment to root crops. Taro is a very good source of calories provided by starch that is easily digested by virtue of the fineness of its grains. It is even used for making hypo-allergenic foods for invalids suffering from gastric ulcers, and tiny pots for babies! It is also rich in fibre that helps intestinal movement, and in calcium and iron.

Other uses

Taro is a culturally important plant, present even in legend. It is also a good ritual plant distributed abundantly during the grand ceremonies.



Genus *Cordyline*

Family
Agavaceae

Species present
Cordyline terminalis (L.) Knuth
Cordyline

Cordyline is one of the most important Oceanian plants. In earlier times its tuber was eaten and its leaves served as skirts for women on certain islands. Nowadays it is principally an ornamental plant, scarcely eaten except in times of famine.

References

Barrau (1962), Cox (1982), French (1986), Guillaumin (1946), Neal (1929), Ochse & Bakhuizen van den Brink (1980), OMS (1998), Parham (1972), Peekel (1984), Pétard (1946, 1986), Seeman (1873), Zeven & de Wet (1982).

Food in times of famine, local

Cordyline terminalis

Cordyline

Nagriamel movement, which amongst other things preaches a return to the traditional way of life, takes its name from cordyline (*nagaria*) and cycad (*namwele*).

History

Cordyline originates from South-east Asia, northern Australia and Melanesia. It was certainly spread in Oceania by humans as they migrated through the region. In Vanuatu its ancient use as a food has almost disappeared, and villagers nowadays grow it as an ornamental plant. It does, however, retain some cultural value in certain communities. For example in Fanafo the

Description

Plant 3–5 m tall; trunk long and narrow. The root swells into a large, fibrous tuber 10–20 cm in diameter. Leaves terminal, arranged in a spiral, smooth, thick and long (60 x 15 cm); veins fine and longitudinal. Inflorescence terminal, branching and long (30–60 cm); numerous small flowers with six lobes, white, purple or lilac. Fruits round, yellow or red, 1 cm in diameter.

Morphological variability

Numerous varieties exist according to the colour of the leaves. Wild forms found in the forest are usually green, while cultivated varieties have red, yellow, pink or feathery leaves. New varieties can appear as a result of sexual crossing, which though rare does occur naturally in gardens around the villages. Cultivars whose tubers are eaten have been selected for large tuber size, tenderness and least amount of fibre, while the ornamental plants have been selected for the appearance of their leaves.

Cultivation and production

The plant grows from sea level to 2,600 m altitude and is found in various different environments. It is propagated by cuttings of stems that are planted directly into the soil, and these grow again very quickly and easily. It becomes lignified and is perennial; it is often cut back with a machete to restore the vigour and increase the thickness of the plants. No serious pest or disease problems are recorded.

Alimentary uses

The tuber and the young leaves are edible, but in Vanuatu only the former was used. In earlier times it was eaten when food was scarce, after having been

cooked for a long time in an oven of hot stones. In the centre of Santo an exclusively male ritual existed in which several communities came together around a dish of cordyline. The modes of preparation varied slightly from one island to another. In Erromango, Futuna and in the centre of Santo, the well-washed tuber was cooked whole in a large oven. In Erromango, and also in Pentecost and in Futuna, it was first peeled and cut before being cooked in an oven. In Tanna the tuber was peeled, cut into pieces and then grated. The resulting puree was then mixed with coconut milk and used to make small lap-laps, which after cooking were crushed in the hand before being eaten.

Cordyline, which is very hard and fibrous, is chewed like chewing gum when it is insufficiently cooked.

Other uses

Cordyline was cultivated in Santo for its coloured leaves from which women made skirts. A simple leafy sprig was spread from the base of the back and tied with a cord belt. The plant has a reputation for keeping away evil spirits, and it is always planted in cemeteries. It is also used for marking boundaries of patches of land in gardens and irrigated taro pits, and as a hedge around villages and houses.

Genus

Cyrtosperma

Family

Araceae

The genus is pantropical and contains 11 species. Only one species is present in Vanuatu.

Species present

Cyrtosperma chamissonis (Schott.) Merrill

Giant swamp taro

Giant swamp taro is little cultivated. It may sometimes be found in a garden, most often on the banks of a small watercourse. But it is present in Vanuatu, and people may turn to it for food in times of scarcity.

References

Barrau (1962), Bradbury & Holloway (1988), French (1986), **Hay (1990)**, Ivancic & Lebot (2000), Lambert (1982), Plucknett (1970), Purselove (1988).

Local plant, eaten occasionally

Cyrtosperma chamissonis

Giant swamp taro

History

Originating from the coastal zones of Papua New Guinea, giant swamp taro has moved with humans throughout the islands of Oceania. This is a taro that is little cultivated except by inhabitants of Micronesian atolls.

Description

Large herbaceous plant 3–4 m tall. Large, almost cylindrical corm, from 20–40 kg. Leaves

erect, **sagittate**, triangular, with three roughly equal lobes, the two lobes at the base being long and pointed; long, thick petiole, cylindrical, sometimes furnished with spines at the base. Thick, open spathe; spadix with **hermaphrodite** flowers.

Morphological variability

Varieties are very numerous according to shape, size and colour of leaves, and colour and size of the spathe. From an agronomic point of view cultivars vary according to their yield and their tolerance to salinity. It is hard to know the diversity of this plant in Vanuatu because it is not much cultivated there.

Cultivation and production

Giant swamp taro is grown in marshy areas, the beds of small watercourses, or the cultivation pits cut out by people in the coral islands of Micronesia and Polynesia. The plants are propagated vegetatively by planting pieces of corm or suckers in the

soil. The corm reaches maturity in three to four years, sometimes two, and may stay in the soil for ten or so years.

Alimentary uses

The corm is peeled and cut into pieces, then boiled or baked. It is not much cultivated or eaten in Vanuatu.

Genus

Dioscorea

Family

Dioscoreaceae

The genus comprises 603 species, distributed throughout tropical regions and independently domesticated on three continents. Over 50 species are edible, and without doubt these were important food for the first humans. Vanuatu is home to seven species, five of which are local and two introduced since European contact.

Species present

Dioscorea alata L.

Winged yam, greater yam, water yam

Dioscorea bulbifera L.

Air potato, aerial yam, potato yam

Dioscorea esculenta (Lour.) Burkill.

Chinese yam, lesser yam, sweet yam

Dioscorea nummularia Lam.

Pacific yam, hard yam

Dioscorea pentaphylla L.

Five-fingered yam

Dioscorea rotundata Poir. and *D. cayenensis*

African yam, white yam

Dioscorea trifida L.

Cushcush, Indian yam

References

Adeleye & Ikotuu (1989), Alexander & Coursey (1969), Bahuchet *et al.* (1991), Bonnemaison (1991), Bourret (1973), Bradbury & Holloway (1988), **Burkill (1960)**, Coursey (1976, 1983), Dumont & Marti (1997), Hamon & Bakary (1990), Hamon *et al.* (1995), Lebot *et al.* (1998), Marchand & Girardot, eds (1998), Martin & Rhodes (1977), Ochse & Bakhuizen van den Brink (1980), Osagie (1992), Smartt & Simmonds, eds (1995), Weightman (1989), Wilson (1988).

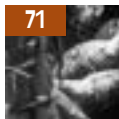
Staple food plant, local

Dioscorea alata

Winged yam, greater yam, water yam

History

The origin of this species remains a puzzle. It does not exist in the wild state, but recent work has confirmed its close relationship





Dioscorea alata

with *D. nummularia*, a species that is typically Melanesian and with which it shares a number of characters. It is certainly one of the most ancient of cultivated plants. Domesticated in New Guinea, which is also its centre of diversity, and then distributed throughout the tropical world, it is the best represented of the species of yams. It reached Vanuatu at a time that is still uncertain, probably with the

people who made the Lapita pottery 2,500 years ago, but it may even be older than that. The winged yam, a seasonal plant, is used everywhere in customary exchanges, and is the staple food of coastal populations. The vegetative cycle of this yam sets the rhythm for the village life, for certain rituals and for the cultural calendar. Some communities, such as those on the west coast of Santo, gained access to these

yams relatively late, a short while before the advent of Europeans. Their culture and their utilisation of the yam for food are thus less developed than in the rest of Vanuatu.

Description

Climbing plant; stem smooth, square or winged, twining to the right. Leaves **opposite**, heart-shaped, more or less round or elongate according to cultivar, light green to dark green. Some **bulblets** in certain cultivars. Tubers extremely variable in shape, number and size; long tubers are usually single, round tubers usually three or four.

Morphological variability

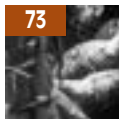
The morphological variability of this species is very important, each community having its own special collection of cultivars and its own classification. Over 500 different varieties are known from Vanuatu. Numerous forms contain anthocyanin which colours the flesh pink, mauve or violet. They are most often grouped according to the local taxonomies. The shape of the tuber, often resembling human anatomy, may be round, cylindrical, very elongate, with a number of side branches, smooth or embossed, or recurved in a hook-shape, sometimes extravagantly so. The elongate yams are associated with men, the round ones with women. The size of the tuber is likewise very variable. Generally the cylindrical and very long yams, which are difficult to harvest, are the

varieties destined for offerings and exchanges, while the short, round ones are the varieties for daily use. The above-ground parts, stems and leaves, also have very diverse morphology and colouring. The villagers distinguish their cultivars according to taste and cooking quality, and grow for example certain yams that are particularly soft for children and old people who no longer have teeth. Finally, certain cultivars are resistant to anthracnose¹². The species is dioecious (separate male and female plants), but it is rare that the plants flower in Vanuatu and most of the ones that do are male.

Cultivation and production

This species is the most important in Vanuatu. It is grown annually on slopes that are very sunny and have fertile soil. Gardens are opened up each year between August and November. After the vegetation has been cut and burned, whole tubers or, more rarely, pieces of tubers are planted in the soil. The heavier the planting material, the greater the subsequent yield. The soil is generally buttressed around the tubers, but the size and shape of these mounds varies with the community. The most imposing are found in Malekula, where the round hillock is often high, and in Tanna where the yams are cultivated on long platforms. Once the stems emerge from the ground, the yam is staked. There again the types of stakes vary – a simple reed or bamboo stake,

¹² A fungal disease caused by *Colletotrichum gloeosporioides*, an epidemic of which can blacken the leaves so quickly that the farmers think that the damage has been caused by thunderbolts.



a trellis, or a long tree branch or trunk of a tree killed for the purpose. The yams are harvested between March and August, but the dates vary a little from north to south, planting and harvest being earlier in the north and later in the south. There are also some stands of *D. alata* maintained close to villages or along forest footpaths in sunny positions. The main disease is anthracnose.

Alimentary uses

Conveniently, yams keep for several months in shade and humidity as long as they have been harvested carefully and are undamaged. The tubers are laid out along bamboo beds, covered with leaves of *Heliconia* or shaded by small awnings built for this purpose in the gardens. They are eaten whole, baked over glowing embers, or cut in large pieces and baked in an oven of hot stones, or boiled in a *marmite*¹³, or grated and used for *lap-lap*. Yams are sold seasonally in the markets, but it remains predominantly a food plant for home consumption, and is present in all feasts.

Other uses

Yam is, together with taro, one of the two ritual plants of Vanuatu. Its morphological plasticity has encouraged farmers to produce some tubers of extraordinary shapes, such as yams close to 2 m in length offered with great display during ceremonies that

bring together several communities. Farmers who are able to grow such yams are accorded great prestige, which is also reflected on the community to which they belong. The growing of these yams is always carried out by men.

Complementary food plant, local

Dioscorea bulbifera

Air potato, aerial yam, potato yam

History

Originally from Asia, Africa and Oceania, this species was independently domesticated in all three regions. It reached Vanuatu in a time long ago, maybe even before the arrival of humans because it is not impossible that bulblets could be dispersed naturally from island to island through the agency of marine currents. It is a wild plant that occurs in a spontaneous state throughout Melanesia and in Australia.

Description

Stem round, twining to the left, without spines. Subterranean tuber small or absent, spongy. Leaves **alternate**, broad, round, heart-shaped; leaf blade embossed; veins well marked; petiole long and jointed at the base. Bulblets in the **axils** of leaves, abundant, round, sometimes large in size, epidermis pale, flesh yellow or reddish, sometimes toxic.

¹³ A round iron cooking pot used particularly for stews.



The corm of *Alocasia macrorrhiza* grows up out of the ground. The ni-Vanuatu also call this large plant elephant's ear.

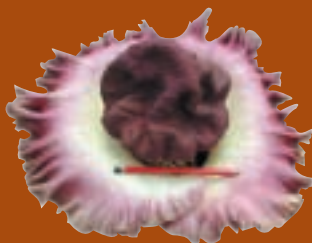


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ROOT AND TUBER CROPS



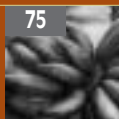
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The inflorescence of *Amorphophallus campanulatus* gives off an evil-smelling odour.

Amorphophallus campanulatus. Wild form, irritant.



Roots and tubers are the major food plants,
around which the agricultural cycle revolves.



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Collection of taros (*Colocasia esculenta*) at the Chapuis Agricultural Station (Santo).



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Colocasia esculenta. Over 500 cultivars of taro are known. The colour of the petiole, or of its point of attachment, the shape of the leaves, or the existence of red edging at the leaf margin, are among the characteristics for differentiating the cultivars. Here are some examples.

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In Luganville market taros are sold in bunches, tied together around their petioles.



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Taros sold by the single piece, with the petiole removed.



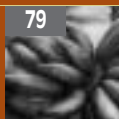
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Cordyline terminalis, an ornamental plant and a plant used in times of food scarcity, has great cultural significance.



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Rare in Vanuatu, giant swamp taro (*Cyrtosperma chamissonis*) grows near small watercourses.



Dioscorea alata. The lush vines of the winged yam twine around their supporting stake.



Dioscorea alata, the winged or greater yam, is the most important species in Vanuatu. Like taro, it is one of the great ritual plants.

Male flower of *Dioscorea alata*.



The tubers of *Dioscorea alata* are variable in shape.

Cultivar of *Dioscorea alata*
with rounded leaves.

Like taro, the winged
yam has several
hundred cultivars,
of which these
are two examples.

Cultivar of *Dioscorea alata* with
triangular leaves and mauve stems.

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The toxic substances in *Dioscorea bulbifera* disappear after careful washing and cooking.



Supporting stake bearing vines of *Dioscorea bulbifera* in a garden.

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Leaves of *Dioscorea esculenta*, the Chinese yam.



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Cultivar of *Dioscorea bulbifera* with purple leaf veins.



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Tubers of *Dioscorea bulbifera*.

Tubers of *Dioscorea esculenta*.



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Leaves of *Dioscorea nummularia*, called the wild yam.



© F. Tzerkiantz

Baked, boiled or in a *lap-lap*, *Dioscorea nummularia* is very popular. It is a food during the transition between the two major yam harvests.

The cultivar Maro of *Dioscorea nummularia* is famous for the whiteness of its *lap-lap*.

The five-lobed leaves of *Dioscorea pentaphylla*.



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The large tuber of
Dioscorea pentaphylla.

Leaves (above) and tubers (below) of *Dioscorea rotundata-cayenensis*, the African yam.



© D. Greindl



Children like
the sweet taste
and soft flesh of
Dioscorea trifida.



The winged stalk of *Dioscorea trifida*, introduced to Vanuatu.

© A. Walter

The trilobate leaf of *Dioscorea trifida*, the cushcush or Indian yam.



© A. Walter

Ipomoea batatas. Sweet potato with purple flesh (Santo).



© A. Walter

Sweet potato and cassava, two other staple food plants, were introduced to Vanuatu.

Violet sweet potato with white flesh, a form occurring in Vanuatu.



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White sweet potato.



© D. Greindl

Row of cassava plants (*Manihot esculenta*) in a garden.



© D. Greindl

The leaf of cassava (*Manihot esculenta*).



© V. Lebot



Lap-lap from cassava. The crusting comes from long cooking at low heat with coconut cream.

Pueraria lobata. Its tuber is still grown in some gardens.



Tannia or macabo (*Xanthosoma sagittifolium*) growing in a garden in the forest.



© V. Lebot

Tannia, or macabo, is increasingly often replacing taro in the gardens and in the diet.

Xanthosoma sagittifolium: inflorescence.

Secondary corms or cormlets of tannia (*Xanthosoma sagittifolium*) for sale by the basket.

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Morphological variability

The wild forms seem to be relatively homogeneous, but several dozen local cultivars are recognised according to the size and shape of the leaves and the bulblets, the colour of their skin and their flesh – white, yellow or mauve. Flowering is relatively common among these individuals.

Cultivation and production

This yam may be collected from the forest where certain stands of edible cultivars are protected and even tended. There are also some cultivated forms, propagated vegetatively in the gardens amongst other yams, by planting a bulblet as one plants a potato. The yield of these bulblets is impressive and may reach several kilos per plant, sold by the basketful at the market.

Alimentary uses

This species, when growing naturally, contains some toxic substances (alkaloids), which are soluble in water and are therefore destroyed by cooking. In earlier times these yams were grated and washed for a long time in flowing water before being eaten. It is generally the above-ground bulblets that are eaten, but some cultivated forms exist that produce edible tubers. Nowadays forms are grown in the gardens that are non-toxic, although they are slightly bitter when they have grown in full

light. However, in times of food shortage these wild forms may be eaten after having been cooked in the ancient way, i.e. grated and carefully washed.

Other uses

The wild forms of *D. bulbifera* have been found by recent research to contain anti-fungal agents (dihydrodioscorine). Initial analyses carried out in scientific laboratories have been promising.

Staple food, introduced (or local?)

Dioscorea esculenta

Chinese yam, lesser yam, sweet yam

History

Originally from Southeast Asia, this species was spread around the Pacific by human migration. It is believed to have been relatively late arriving in Vanuatu. In Santo, the most ancient cultivars have been partially replaced by forms of better quality introduced from New Caledonia called *wovilé*.

Description

Round stem twining to the left, set with small spines along its entire length. Tubers numerous, oval, spiny, with white, pink or purple flesh. Leaves heart-shaped, almost round, pilose at the extremity of the stems, small in size; no bulblets.

Morphological variability

For an introduced species it has great importance; several dozen varieties exist that are distinguished by the size of the leaves, the number of tubers per plant and their shape, and by the colour of the flesh which varies from white to dull purple. Some varieties have very primitive characteristics such as the presence of spines on the roots which make their harvesting tricky. Few of the cultivars flower.

Cultivation and production

This species is cultivated in yam gardens alongside *D. alata*, and is planted after *D. alata*. In some cases it is planted in the same place and therefore needs little work. It is harvested 8–9 months later and its yields are very high. On research stations experiments have recorded yields of close to 100 tonnes per hectare. This species is hardy and resistant to anthracnose and viruses, and with a little care it produces some impressive yields. It is thus tending to increase in amount grown, even though its sweet taste is not really what the consumers prefer. Its tubers keep very well, and if it is damaged during transport its epidermis heals over very easily. It rarely rots, and it only dries out slowly.

Alimentary uses

This yam has a tuber that is less fibrous than those of other species, and a taste that is slightly sweet. It is mainly eaten baked

or boiled, sprinkled with coconut milk, but its flesh is too watery to make *lap-lap*. It sells well in urban markets.

Complementary food plant, local

Dioscorea nummularia

Pacific yam, hard yam

History

A very ancient plant, this yam is native to Melanesia and does not occur in Asia. Its centre of diversity may be Papua New Guinea, but in Solomon Islands and Vanuatu spontaneous forms occur in the forest, and there are hundreds of cultivars. It always seems to have been domesticated, particularly in the island of Malekula.

Description

Stem round or with four or more angles, twining to the right, very spiny at the base; long lateral branches. Elongate tuber, sometimes of irregular shape and branched, covered with tiny roots, variable in size, with hard flesh, generally white but occasionally pink. Leaves cordate; bulblets absent.

Morphological variability

Less variable morphologically than *D. alata*, this species nevertheless contains a good hundred or so different cultivars. In certain regions such as Malekula and Santo, it is as important if not more important than the winged yam. Its true variability

is difficult to study because a good number of the forms are found in the forest where they are maintained by farmers. Some are cultivated annually, others are perennial plants that produce new stems every year.

Cultivation and production

This species is one of the yams that are called 'wild', which are cultivated minimally in forest areas but which may also be planted in yam gardens after *D. alata*. Certain communities such as those of Malo put aside a special garden for *D. nummularia*. It is planted between October and November, and is cultivated with less care than *D. alata* except on the patches of land that are reserved for it. It is harvested after the winged yam, but some cultivars may be left in the soil for two to three years. It thus plays an important role in strategies for food security, since it provides a transitional source of food between the main yam (*D. alata*) harvests and it provides something to eat throughout the year. The communities of Malo have developed production of this species for sale in the market of Luganville, which provides them with a useful cash income. However, farmers are becoming concerned at the increasing popularity of *D. nummularia*, because this yam is taking up a lot of land and requires the killing of many trees so that their trunks can serve as supports for the yam vines. In earlier times this yam was largely maintained in the

forests in order to provide a food reserve that was rapidly available if needed. Its period of dormancy is relatively short, and the tubers produce new stems less than two months after harvest. No serious pest or disease problems are known and it is highly resistant to anthracnose, making it popular in areas where anthracnose is a dominant disease. Farmers of Mele (Efate) for example are nowadays cultivating this species. The yield is such that a plant may be partly harvested each year while being left in the ground to continue growing.

Alimentary uses

The taste of this yam is popular, and according to cultivar it is eaten baked, boiled or as *lap-lap*. The well-known cultivar Marou, originally from Malo, is very much favoured because of the whiteness of the *lap-lap* that can be made from it, which is a characteristic favoured by the consumers. The dry matter contents of the different cultivars are very high.

Food plant occasionally eaten, local

Dioscorea pentaphylla

Five-fingered yam

History

This wild species was without doubt distributed through the Pacific islands before the arrival of the first people. It is abundant in Vanuatu, available from the forest and in gardens where farmers often cultivate a few stands.

Description

Stem round, twining to the left, spiny. Tuber round, often flattened and compact. Leaves **palmate** with five leaflets; some small bulblets.

Morphological variability

The species has several cultivars which vary according to the production of bulblets (very abundant or absent), the ability to flower (some forms are sterile), and in the colour of the flesh of the tubers which can vary from white to purple.

Cultivation and production

Often considered to be a wild yam (along with *D. bulbifera* and *D. nummularia*), this species is harvested from or cultivated in the forest, without disturbance of the environment. After a shady spot has been chosen, close to a tree that can later serve as a support for the vine, the ground is lightly weeded, then a piece of tuber is planted in the soil in a shallow hole scooped out by hand. The spot is marked or remembered, and when the tuber reaches maturity it is harvested with great care. The crown is then immediately set apart and replanted in the same spot, together with secondary tubers that are too small to harvest. The density of the crop is low, ranging from a single stand up to twenty or so in the same area. The species is very resistant to disease, and certain cultivars can be propagated easily from bulblets.

Alimentary uses

This yam tastes like potato, and is very popular. It is eaten less now than in earlier times, but because of the increasing importance of anthracnose it is likely that this species will become increasingly popular.

Staple food plant, introduced

Dioscorea rotundata
Dioscorea cayenensis

African yam, white yam

History

The species appeared in West Africa through the crossing of *D. cayenensis* with other local species (*D. praehensilis* and/or *D. abyssinica*). The compound name of *Dioscorea cayenensis-rotundata* is used to cover the huge complex of forms resulting from this cross. It was introduced to Vanuatu about fifty years ago, from the east coast of New Caledonia and the town of Houailou (which is also used as a name for this yam – *wailu* in Bislama). In New Caledonia it is called ‘martiniqueise’ because of its origin from Martinique in the West Indies. It is becoming very popular, doubtless because of its rapid maturation and its resistance to anthracnose, even though its taste is relatively insipid.

Description

Small number of stems per plant, but many branches per stem. Canopy bushy, heavy and well developed. Stem round, light

green, waxy, twining to the right; slightly spiny at the base; short lateral branches. Tuber often single, skin light chestnut in colour, cylindrical, smooth, with white flesh. Tuber dormancy is shorter than that of other species of yam. Leaves cordate, elongate, dark green; no bulblets.

Morphological variability

There is great morphological heterogeneity in the area of origin of this yam complex. In Vanuatu it is very limited – two cultivars of *D. rotundata* with white flesh and some of *D. cayenensis* with yellow flesh. The variety called *Six manis* in Bislama is known for its short life cycle of *six months*, but its tuber tends to subdivide and its harvest is tricky.

Cultivation and production

This yam is cultivated like the winged yam, and the yield depends on the weight of the material that was used for planting. In contrast to *D. alata*, it does not do well without staking or other support and requires much work to be undertaken. Its harvest requires great care because the epidermis of the tuber copes less well with damage than other yam species. It is likewise necessary to be careful when transporting this yam because jolting can cause rapid rotting of affected tubers. It is also very susceptible to nematodes that damage the tubers and render them unsaleable.

Alimentary uses

This yam is suitable for making *lap-lap*, but people prefer to eat it boiled.

Food plant occasionally eaten, introduced

Dioscorea trifida

Cushcush, Indian yam

History

This species originates from America, where it was domesticated in the region of the frontier between Brazil and Guyana before being spread through the West Indies. It was introduced to Vanuatu quite late and it is not very common there, but is becoming increasingly popular.

Description

Stem twining to the left, quadrangular, winged, without spines. Small tubers 20 cm in length, grouped fifteen to twenty in the one stand; flesh white, yellow, pink or purple. Leaves with three or five lobes; bulblets absent.

Morphological variability

There is not much variability in Vanuatu. Only one clone is known, which has the strange name *Africa* in Bislama (strange since it is an American species). The species is spread around the archipelago, though in any one place there will only be a few stands grown.

Cultivation and production

It is planted like other yams but its vegetative cycle is relatively long, and it is brought to market in August and September. It is resistant to anthracnose but very susceptible to Yam Mosaic Virus (YMV) – however, at present this disease is absent from Vanuatu.

Alimentary uses

The small tubers are cooked like new potatoes, as boiled or steamed vegetables. It is very fragrant, and its sweet taste combined with its soft flesh makes it a popular yam with young children. It is not suitable for making *lap-lap* because it does not have much dry matter.

Genus

Ipomoea

Family

Convolvulaceae

This important genus comprises around 400–500 species, distributed throughout the tropical regions. It is divided into several sections, of which the section *Batatas* includes eleven species plus one hybrid and originates from America. Two species are present in Vanuatu.

Species present

Ipomoea aquatica Forskal

Water spinach, kangkong, swamp morning glory (cf. p. 200, climbing plants)

Ipomoea batatas (L.) Lam.

Sweet potato

Sweet potato is introduced, and has become one of the main food plants of Vanuatu.

References

Austin (1988), Barrau (1962), Cornelis (1985), Cornelis & Nugteren (1982), **Fosberg & Sachet (1977)**, French (1986), Lin *et al.* (1985), Nishiyama (1971), Ochse & Bakhuizen van den Brink (1980), Piperno & Pearsall (1998), PROSEA (1994), Purseglove (1991), Rubatzky & Yamagushi (1997), Sauer (1993), Smartt & Simmonds, eds (1995), Weightman (1989), Worsley & Oldfield (1988), Yen (1974, 1976, 1982).

Staple food plant, introduced

Ipomoea batatas

Sweet potato

History

Sweet potato (*Ipomoea batatas*) originates from Peru, Colombia and Ecuador. It was probably introduced during the 16th century to Papua New Guinea and all of Melanesia. This geographical

region is home to thousands of cultivars and represents a second centre of diversification, interesting because of the high content of dry matter and low degree of sweetness of some of the cultivars. Various theories on how sweet potato reached the region are now discredited – that it was brought from Latin America by canoe piloted by Polynesians or Amerindians, that it was brought to New Zealand in prehistoric times or by the

first wave of explorers, that it was introduced to Melanesia by the ancient Polynesians a little before the arrival of the first Europeans, or that it was brought by the Europeans. One fact is certain – that it was already present in Hawaii before the arrival of Captain Cook. It seems certain that it reached Vanuatu relatively late, towards the end of the 17th century, arriving simultaneously in the north (Santo) and the south (Futuna). It is increasingly grown there and eaten very widely. Research on sweet potato and its improvement began in Vanuatu in the 1980s.

Description

Creeping plant whose stems have internodes from which roots arise. Just beneath the surface of the soil, thickening of the adventitious roots produces a dozen or so tubers, **fusiform** or **globular**, smooth or furrowed, white, yellow, orange, red or violet. Leaves simple, arranged in spirals, entire or deeply lobed, oval, green or with a violet hue, 15 x 15 cm; petiole 5–30 cm long. Flowers solitary, trumpet-shaped, purplish, 4 cm in diameter. Small fruits with 4 black seeds, sometimes not properly developed because pollination is incomplete.

Morphological variability

Fifty or so local cultivars occur in Vanuatu, distinguished according to the size, colour and texture of the tubers, the shape and colour of the leaves, and the length of

the stem. The taste, consistency and cooking time of the flesh also vary. In places where the foliage of sweet potato is fed to pigs, varieties with perennial stalks that produce lots of leaves are prized. From an agronomic point of view, cultivars vary according to their time to reach maturity and their resistance to local diseases, the most serious of which are viruses and above all the sweet potato weevil (*Cylas* spp.). The northeast region of Santo is one of those where the diversity is greatest. However, over recent years new hybrid varieties have been introduced by the Department of Agriculture and compared with the local varieties.

Cultivation and production

Sweet potato is present from sea level to about 1,000 m altitude, in sunny areas. It is a perennial plant that is generally cultivated as an annual. It is propagated vegetatively by stem cuttings, or much more rarely by pieces of tuber. It is harvested after about 3–8 months, its productivity is high and its cultivation is easy. Further, when the fallow time is shortened and the area becomes grown over with vegetation, it is useful to plant some sweet potatoes whose vines restrain the vegetation regrowth. The two most serious diseases are a fungal disease, scab (*Elsinoe batatas*), which damages the young leaves, and a mycoplasma that causes their dwarfing. The scab is a real problem as cropping



intensifies, and rotations are necessary to avoid a devastating build-up. From time to time farmers must make seedbeds, planting in them tubers which sprout and provide vines that are more vigorous for production of cuttings. For a single variety the yield may vary greatly according to the season. When it is hot and humid, sweet potato makes few tubers but many stems and leaves, and the opposite when it is cool and dry. It is thus best to grow it from May to December.

Alimentary uses

Sweet potato occupies an increasingly important place in the nutrition of the ni-Vanuatu. It is eaten baked or boiled in a *marmite*, but its flesh is too

sweet to be made into lap-lap. Only the region of Port Orly is known for its lap-lap made from sweet potato, which makes a very good dessert. Sweet potato is available throughout the year, and is sold regularly and well in local markets. It may be kept for a few weeks in shaded and dry conditions. The tips of the stems are often used as a vegetable, and are sold as such in the markets. They may also be made – but not very often – into chips that are sold in groceries.

Other uses

The stems and secondary tubers are fed to pigs. Farmers value their ability to cover the soil and to keep plots of land neat and clean.

Genus

Manihot

Family

Euphorbiaceae

The genus comprises about a hundred species distributed from southern Arizona to Argentina, the two centres of diversity being Mexico and Brazil.

Species present

Manihot esculenta Crantz

Cassava, manioc, tapioca

References

Allem (1999), de Candolle (1883), Charrier *et al.*, eds (1997), Mathon (1981), McKey & Beckerman (1993), Nassar (1978), Ochse & Bakhuizen van den Brink (1980), Piperno & Pearsall (1998), Purseglove (1991), **Rogers & Appan (1973)**, Rogers & Fleming (1973), Sauer (1993), Silvestre & Arraudeau (1983), Smartt & Simmonds, eds (1995), Viard (1995), Weightman (1989), Zeven & de Wet (1982).

Staple food plant, introduced

Manihot esculenta

Cassava, manioc, tapioca

History

The most ancient traces of cassava (macrobotanical remains and grains of starch) have been found in the north of Peru, and have been dated as 8400–6000 years before our era. But the exact origin of this plant is not well understood, though its cultivation was already well developed in Latin America 4,000 years ago. The genus *Manihot* is considered to be a complex of species in which natural hybrids are numerous and common.

Domestication probably occurred with intra- and inter-specific hybrids in the Rio Negro region situated in the north of the Amazon Basin. Cassava (*Manihot esculenta*) is diploid, and emerged from successive hybridisations between wild species. Various studies suggest that the species involved were *M. flabellifolia*, *M. peruviana* and *M. glaziovii*. In the 16th century the Portuguese introduced cassava to the Gulf of Benin and the mouth of the River Congo. At the end of the 18th century the plant reached Réunion and Madagascar, then it spread throughout the rest of Africa, particularly during the 20th century. Nowadays Africa is the largest producer



Manihot esculenta

of cassava, and is considered together with Indonesia to be a second centre of diversification. Cassava doubtless spread to the Pacific via the Philippines, and was very quickly adopted by local populations. Cultivation of cassava continues to increase, and more and more its consumption rivals that of local root crops or rice. The history of the penetration of cassava into Vanuatu is still a mystery, and there are two possible modes

of entry. The first could be from New Caledonia where the plant was introduced in about 1850 by immigrants coming from the island of Réunion. The second involves the region of Samoa and Tonga, from where cassava was introduced to New Caledonia, and from there to Anatom by James Paddon. Since the end of the 19th century cassava has been widely adopted by local people and is grown in all the gardens.



Description

Shrubby tree with a short life-span, reaching up to 7 m in height. Sturdy trunk, sometimes branching at the **apex**, with obvious leaf scars along its length. Tubers develop from swelling of secondary roots close to the main stem, and may reach 1 m in length by 10 cm in diameter. Epidermis smooth or wrinkled, brown, whitish, pink or red. Underlying **cortex** thin, white, sometimes tinged with red or brown. Flesh white, yellow or streaked with red. Leaves arranged in a spiral, palmate with three to nine deep lobes, oval or lanceolate, green or tinted with red, 4–20 x 2–6 cm; petiole green or red, 5–30 cm long. Inflorescence terminal, with male flowers and broader female flowers, both with a **calyx** with five triangular lobes. Fruit globular, 1.5 cm long, bearing six fine **wings**, containing three seeds that are explosively dispersed three to six months after pollination.

Morphological variability

A primary distinction is into cultivars with a short crop cycle, that reach maturity in six months and can be kept in the soil for nine to ten months, and those with a long crop cycle which take a minimum of a year to reach maturity, some of which can remain in the soil for three to four years. The former are mainly cultivars with sweet flesh, the latter with bitter flesh. In Vanuatu there are about fifteen varieties of sweet cassava, where cyano-

gens are not present in the epidermis, and the diversity is far less than that found in the Amazonian region. The varieties are principally distinguished on the basis of morphological characteristics (degree of erectness, leaf colour, shape of tubers, etc.). As a priority farmers also look for early-maturing genotypes and high yields. Selection is for strength of the stems, disease resistance, individual yields, and most of all quality – dry matter content and starch particularly. Many cultivars never flower, sometimes because of absence of floral initiation, sometimes because the flower buds always abort before becoming functional flowers. However, in Vanuatu flowering is frequent, and it is not impossible that some local varieties have come from seeds that have germinated in the field and the resulting wild plants have been cloned.

Cultivation and production

Cassava is not frost-tolerant, and is grown mainly in lowland tropical areas. It can survive periods of drought and will grow in any sort of soil – characteristics which make it a plant in times of need that is much appreciated. It is easy to grow in soils that have been impoverished by previous crops such as cocoa and coconut. It is propagated from stem cuttings, since plants resulting from spontaneous germination of seeds grow very slowly. Its cultivation in Vanuatu is increasing because it allows



depleted soils to recover, and it complements traditional root crops that are less easy to grow – important for a growing population. For this reason it is often used at the end of crop rotations in gardens just before the fallow, or it is planted at the edges of huts or tracks in poorly prepared land. No serious pests or diseases are known, except for pigs that cause a great deal of damage. The majority of varieties stand erect, which is convenient for cutting the stem into sections before the arrival of a cyclone that readily knocks down the plants and causes them to rot within a matter of days.

Alimentary uses

The roots are peeled and washed, then cut into pieces and boiled, sometimes twice in succession. It is eaten as it is, or flavoured

with coconut milk. The raw root is often grated, sometimes flavoured with coconut milk, then baked in an oven of hot stones, or in small quantities in a section of bamboo. Finally, the plant is the main ingredient in the manufacture of *tuluk*: the root is cooked, pounded and then kneaded in to a paste and flavoured with coconut milk; the paste is then rolled into little puddings, stuffed with force-meat (often canned meat), then cooked again in a bamboo or *marmite*. In some parts of the world flour is made from cassava, but not in Vanuatu. The young leaves, although very rich in proteins, are not eaten, unlike in other tropical countries.

Other uses

Cassava is also used as a forage plant.



Genus *Pueraria*

Family
Fabaceae

Species present

Pueraria lobata (Willd.) Ohwi

Kudzu, pueraria

Kudzu is no longer eaten regularly, though it undoubtedly was by the ancient Oceanians. But it is not rare, and it is sometimes found in gardens.

References

Barrau (1962, 1965), French (1986), Parham (1972), Peekel (1984), Purseglove (1991), Sillitoe (1983), Skerman (1977), Zeven & de Wet (1982).

Food plant occasionally eaten, local

Pueraria lobata

Kudzu, pueraria

History

Originally from Asia and Japan, kudzu is a very ancient plant in the Pacific, and was a staple food crop for Melanesian peoples before the arrival of sweet potato. Cultivated in Papua New Guinea and in New Caledonia, it is found from Vanuatu to Samoa.

Description

Climbing plant with a thick stem, flexible and hairy, able to root from nodes to produce secondary stems. Large, elongate tuber,

horizontal, that can reach 1–2 m in length. Leaves pilose, leaflets entire or with slightly demarcated lobes, triangular; **stipules** elongate; long, pilose petioles (5–10 cm). Small flowers in groups, mauve or purple. Pods straight or slightly curved, cylindrical, flattened, pilose. Seeds oblong or square, brown, about 15 in number.

Morphological variability

Not studied in Vanuatu.

Cultivation and production

The plant is cultivated in the gardens of several communities in Vanuatu. It is propagated vegetatively by planting a top of a tuber attached to the stem.

It is mainly used as a cover plant for keeping patches of land clean, but once it establishes it is very difficult to get rid of it.

Alimentary uses

Nowadays this plant is rarely eaten, but a number of communities grow it in their gardens or in forest as a reserve in case of

food shortage resulting from a cyclone. The tubers are generally cut into pieces and baked in a hot stone oven. Certain softer cultivars may be peeled and cut into pieces, then boiled and enhanced with coconut milk. In earlier times it was also used for making *lap-lap*. These fibrous tubers must be chewed for a long time and the fibres spat out.

Genus

Xanthosoma

Family

Araceae

The genus comprises about 40 species, all American. A single species is present in Vanuatu.

Species present

Xanthosoma sagittifolium (L.) Schott

Tannia

Introduced to Vanuatu, tannia is nowadays grown in all the gardens and replaces taro in areas where taro is difficult to grow. The ni-Vanuatu eat it to a major extent.

References

Barrau (1962), Bradbury & Holloway (1988), **Brücher (1989)**, Cable (1984), Ivancic & Lebot (2000), Lambert (1982), Onwueme (1978), Plucknett (1984), Purseglove (1988), Weightman (1989), Zeven & de Wet (1982).

Staple food plant, introduced

Xanthosoma sagittifolium

Tannia, new cocoyam, macabo cocoyam, arrowleaf elephant's ear, yautia

History

Originally from tropical America and the West Indies, tannia was spread during the 19th century to Africa and Asia and throughout the Pacific. It was probably brought to Vanuatu from Fiji, by ni-Vanuatu returning from work in plantations. Its cultivation has increased because it is robust, more resistant to drought and is less work to cultivate than taro.

Description

Herbaceous plant over 1 m in height, with a robust stem. Central subterranean stem (corm) surrounded by a dozen or so lateral cormlets. Leaves sagittate with wide but short basal lobes, 100 x 70 cm; marginal leaf veins very obvious; petiole about 1.5 m long. A group of two to three inflorescences that appear in succession; spathe green or purple; spadix with male flowers in the upper part and female flowers in the lower part, separated by a sterile zone.

Morphological variability

This introduced plant shows only a little variability in Vanuatu, in colour and size of the leaves, the shape of the corm and the pigmentation of the shoots. Twelve different cultivars are recognised in the whole country; they are distinguished by the colour of the petiole – light green to dark purple – and the colour of the flesh of the cormlets – white to purple.

Cultivation and production

Tannia is a plant of humid regions, but it tolerates drought better than taro. It is propagated vegetatively by planting of suckers at any time of the year, and it reaches maturity after nine months. The central corm, which is very acrid, is not harvested, but the lateral corms

are harvested over a period of two to six years. Farmers put them in at a high crop density that totally covers the soil, removing any need to look after the plants. These areas of plants are visited regularly for collection of lateral corms. The main corm is too fibrous to be eaten by humans, and is cooked and given to pigs.

Alimentary uses

Tannia is eaten more and more frequently, especially in the dry islands where true taro grows poorly. Tannia thus complements yams. It is either baked or boiled, and sometimes sprinkled with coconut milk. The young leaves are sometimes used as vegetables. The main corm, which is very fibrous, is a choice food for pigs.

