

Sedge, Sweet

Botanical: *Acorus calamus* (LINN.)

Family: N.O. Araceae

Synonyms

Calamus. Sweet Flag. Sweet Root. Sweet Rush. Sweet Cane. Gladdon. Sweet Myrtle. Myrtle Grass. Myrtle Sedge. Cinnamon Sedge.

Part Used

Root.

Habitat

Found in all European countries except Spain. Southern Russia, northern Asia Minor, southern Siberia, China, Japan, northern United States of America, Hungary, Burma, Ceylon and India.

The Sweet Sedge is a vigorous, reed-like, aquatic plant, flourishing in ditches, by the margins of lakes and streams and in marshy places generally, associated with reeds, bullrushes and bur-reed.

Its erect, sword-shaped leaves bear considerable resemblance to those of the Yellow Flag, hence its equally common popular name of 'Sweet Flag,' though it is not related botanically to the Iris, being a member of the Arum order, Araceae. All parts of the plant have a peculiar, agreeable fragrance.

Formerly, on account of its pleasant odour, it was freely strewn on the floors of churches at festivals and often in private houses, instead of rushes. The specific name, *calamus*, is derived from the Greek *calamos* (a reed).

The floors of Norwich Cathedral until quite recently were always strewn with calamus at great festivals.

As the Sweet Sedge did not grow near London, but had to be fetched at considerable expense from Norfolk and Suffolk, one of the charges of extravagance brought against Cardinal Wolsey was his habit of strewing his floors with fresh rushes.

Most species of this order give out a considerable amount of heat within the spathe at the time of flowering, so that the temperature rises noticeably above that of the external air. Many of the varieties also have lurid colouring and a fetid odour.

The generic name, *Acorus*, is from *Acoron*, the Greek name of the plant used by Dioscorides and said to be derived from *Coreon* (the pupil of the eye), diseases of which the Ancients used this plant to cure.

The rhizomes are an important commercial commodity and of considerable medicinal value.

Though now common throughout Europe, there is little doubt that the Sweet Flag is a native of eastern countries, being indigenous to the marshes of the mountains of India.

It is said to have been introduced into Poland by the Tartars, but not till 1588 is it recorded as abundant in Germany. Clusius, the famous botanist, first cultivated it at Vienna in 1574, from a root obtained from Asia Minor and distributed it to other botanists in Belgium, Germany and France. It is readily propagated and rapidly becomes established. In England, it was probably introduced about 1596, being first grown by Gerard, who says that 'Anthony Coline the apothecarie sent him pieces from Lyons,' telling him that he had used it in his composition of Treacle. ('Treacle' was a term used by the old herbalists for a medicine composed of many herbal ingredients.) Gerard looked upon it as an Eastern plant, which he says is grown in many English gardens and might hence be fitly called the 'Sweet Garden Flag.'

Calamus was largely grown from time immemorial for its rhizomes in the East and the Indian rhizomes were imported extensively long after it was common in Europe. The Indian rhizome is said to have a stronger and more agreeable flavour than that obtained in Europe or the United States.

If the Calamus of the Bible is this plant, Exodus xxx. 23, Canticles iv. 14, and Ezekiel xxvii. 19, are the earliest records of its use.

The *Calamus aromaticus* of the Ancients is thought by some to be a plant belonging to the Gentian family, though the description of the plant '*Acoron*,' a native of Colchis, Galatia, Pontus and Crete, given by Dioscorides and Pliny, seems to refer to the Sweet Flag.

It is now found wild on the margins of ponds and rivers in most of the English counties, and is in some parts abundant, especially in the Fen districts. In Scotland it is scarce. It is found in all European countries except Spain, and becomes more abundant eastward and in southern Russia, northern Asia Minor and southern Siberia, China and Japan. It is also found in the northern United States of America, where it appears to be indigenous.

It is cultivated to a small extent in Hungary, Burma and Ceylon, and is common in gardens in India. In northern China another species is cultivated as an ornamental greenhouse plant, but the wild plant is that generally collected for use, especially in Russia, on the shores of the Black Sea. In 1724, Berlu (*Treasury of Drugs*) states that it was 'brought in quantities from Germany,' hence it may be inferred it was not collected in England until a later period, when the London market was supplied from the rivers and marshes of Norfolk, where it was cultivated in the Fen districts, and from the banks of the Thames, as much as L.40 having been obtained for the year's crop of a single acre of the riverside land on which it naturally grows. But for many years now the native source has been neglected and the rhizomes for medicinal and commercial use are imported. In dry summers, large quantities are collected in the ditches in Germany, but the greater proportion of the imported drug is derived from southern Russia, via Germany.

In the districts in Norfolk where the plant flourishes the villagers call it 'Gladdon,' so the name would appear to apply to more than one species of the family. A few years since, the 'Gladdon harvest' was an important episode in the country of the 'Broads,' and many small boats might be seen laden with this plant, being brought to shore for marketing purposes. Some of the Norfolk churches in country districts are thatched with this 'reed.'

Description

The Sweet Sedge is a perennial herb, in habit somewhat resembling the Iris, with a long, indefinite, branched, cylindrical rhizome immersed in the mud, usually smaller than that of the Iris, about the thickness of a finger and emitting numerous roots. The erect leaves are yellowish-green, 2 to 3 feet in length, few, all radical, sheathing at their bases (which are pink), swordshaped, narrow and flat, tapering into a long, acute point, the edges entire, but wavy or crimped. The leaves are much like those of Iris, but may readily be distinguished from these and from all others by the peculiar crimped edges and their aromatic odour when bruised.

The scape or flower-stem arises from the axils of the outer leaves, which it much resembles, but is longer and solid and triangular. From one side, near the middle of its length, projecting upwards at an angle, from the stem, it sends out a solid, cylindrical, blunt spike or spadix, tapering at each end, from 2 to 4 inches in length, often somewhat curved and densely crowded with very small greenish-yellow flowers. Each tiny flower contains six stamens enclosed in a perianth with six divisions and surrounding a threecelled, oblong ovary with a sessile stigma. The flowers are sweet-scented and so formed that cross-pollination is ensured, but the plant is not usually fertile in the British Isles, as it is in Asia, the proper insects being absent here. The fruit, which does not ripen in Europe, is a berry, being full of mucus, which falls when ripe into the water or to the ground, and is thus dispersed, but it fruits sparingly everywhere and propagates itself mainly by the rapid growth of its spreading rhizome.

It is easily distinguished from all other British plants by its peculiar spadix, which appears in June and July, and by the fragrance of its roots, stems and leaves.

In most localities the flowers are not very abundantly produced: it never flowers unless actually growing in water.

Cultivation

The plants can be propagated very readily by the division of the clumps or of the rhizomes in early spring, or at the commencement of autumn, portions of the rhizome being planted in damp, muddy spots, in marshes or on the margins of water, set 1 foot apart and well covered. It will succeed very well in a garden if the ground is moist, but a rich, moist soil is essential, or it has to be frequently watered.

Collection

It is the root-stock or rhizome that is used for medicinal purposes, a digestive medicine being made from it which is official in the United States Pharmacopoeia and in several others.

Calamus root has also value as a commercial commodity in various industries.

Experiments have lately been made with a distillation of the leaves, and if the fragrant volatile oil contained in them can be obtained successfully on economic conditions, this will create a trade.

The rhizomes are gathered when large enough, generally after two or three years, and before they lose their firmness and become hollow. Late autumn or early spring is the time chosen for collection.

If actually growing in water, the raft-like masses of interwoven roots and mud, which in a river or lake float about a foot below the surface of the water, are cut out in square sections, raked to the lake edge, the leaves stripped off and separated. Whether growing thus actually in water, or in moist ground, the rhizomes are next thoroughly washed in a trough, and then, deprived of the far less aromatic and brittle rootlets, which are 4 to 6 inches long, unbranched, but near the tip beset with soft, thin fibres.

The fresh root-stock is brownish-red, or greenish-white and reddish within and of a spongy texture, tolerably uniform in transverse section. It has an aromatic sweet odour and a bitterish, pungent taste.

The dried rhizome appears in commerce in tortuous, sub-cylindrical or flattened pieces, a few inches long and from 1/2 to 1 inch in diameter; externally, yellowish-brown, with blackish patches; sharply longitudinally wrinkled, the upper surface obliquely marked with broad, dark, often fibrous leaf-scales, which are often broadly V-shaped and have sharply projecting margins, the lower surface is thickly pitted with a zigzag line of circular root-scars, which exhibit a low whitish rim and a dark depressed centre. The fracture is short, sharp, corky, whitish and starchy. The texture is spongy, exhibiting numerous oilcells and scattered wood-bundles.

On drying, Calamus loses from 70 to 75 per cent in weight, but improves in odour and taste. It deteriorates, however, after long keeping.

Since the oil-cells containing the aromatic essential oil are situated in the outer part, peeling the rhizomes before shipping or distilling, as is often done on the Continent, should not be resorted to. Most of the commercial article has the outer portion of the cortex removed, but the handsome, white peeled (German) Calamus of the market cannot be used in accordance with the official requirements of other pharmacopoeias. The peeled rhizome is usually angular and often split. Though white when fresh, it turns pinkish on drying and is less aromatic and bitter than the unpeeled.

Constituents

The properties of Calamus are almost entirely due to its volatile oil, obtained by steam distillation. The oil is contained in all parts of the plant, though in greatest quantity in the rhizome, the leaves yielding to distillation 0.2 per cent, the fresh root 1.5 to 3.5 per cent, the dried German root 0.8 per cent, and the Japan root as much as 5 per cent.

The oil is strong and fragrant, its taste warm, bitterish, pungent and aromatic. Its active principles are taken up by boiling water. It is a thick, pale yellow liquid. Little

is known of its chemistry, though it possibly contains pinene and the chief aromatic constituent is asaryl aldehyde.

The rhizome also contains alkaloidal matter, mainly Choline (formerly thought to be a specific alkaloid, Calamine); soft resin, gum, starch and the bitter glucoside, Acorin, which is amorphous, semi-fluid, resinous, of neutral reaction, aromatic odour and bitter aromatic taste.

Calamus Oil is used in perfumery - an alcoholate is made with 3 kilos to 3.5 kilos of rhizome to 20 litres of 85 per cent alcohol.

Medicinal Action and Uses

Calamus was formerly much esteemed as an aromatic stimulant and mild tonic. A fluid extract is an official preparation in the United States and some other Pharmacopceias, but it is not now official in the British Pharmacopceia, though it is much used in herbal medicine as an aromatic bitter.

On account of the volatile oil which is present, it also acts as a carminative, removing the discomfort caused by flatulence and checking the growth of the bacteria which give rise to it.

It is used to increase the appetite and benefit digestion, given as fluid extract, infusion or tincture. Tincture of Calamus, obtained by macerating the finely-cut rhizome in alcohol for seven days and filtering, is used as a stomachic and flavouring agent. It has a brownish-yellow colour and a pungent, spicy taste.

The essential oil is used as an addition to inhalations.

The dried root may be chewed ad libitum to relieve dyspepsia or an infusion of 1 OZ. to 1 pint of boiling water may be taken freely in doses of a teacupful. The dried root is also chewed to clear the voice.

Fluid extract, U.S.P., 15 to 60 drops.

Calamus has been found useful in ague and low fever, and was once greatly used by country people in Norfolk, either in infusion, or powdered, as a remedy against the fever prevalent in the Fens. Its use has been attended with great success where Peruvian bark has failed. It is also beneficial as a mild stimulant in typhoid cases.

The tonic medicine called Stockton Bitters, formerly in much esteem in some parts of England, is made from the root of this plant and that of *Gentiana campestris*.

Waller's *British Herbal* says:

'It is of great service in all nervous complaints, vertigoes, headaches and hypochondriacal affections. Also commended in dysentery and chronic catarrhs. The powdered root may be given, 12 grs. to 1/2 drachm. In an infusion of 2 drachms to a pint of water or of white wine, it is an agreeable stomachic, even to persons in health, to take a glass about an hour before dinner. When the root is candied with sugar, it is

convenient to dyspeptic patients, who may carry it in a small box, in the pocket, and take it as they find occasion.'

On the Continent the candied rhizome is widely employed. The Turks use the candied rhizome as a preventive against contagion.

The rhizome is largely used in native Oriental medicines for dyspepsia and bronchitis and chewed as a cough lozenge, and from the earliest times has been one of the most popular remedies of the native practitioners of India. The candied root is sold as a favourite medicine in every Indian bazaar.

The powdered root is also esteemed in Ceylon and India as a vermifuge and an insecticide, especially in relation to fleas. Sprinkled round a tree attacked by white ants in Malay (Perak) it was found to destroy those that were near the surface and prevented others from attacking the tree.

In powder, Calamus root on account of its spicy flavour serves as a substitute for cinnamon, nutmeg and ginger.

It is said also to be used by snuff manufacturers and to scent hair-powders and in tooth-powders, in the same way as orris.

The highly aromatic volatile oil is largely used in perfumery.

The oil is used by rectifiers to improve the flavour of gin and to give a peculiar taste and fragrance to certain varieties of beer.

In the United States, Calamus was also formerly used by country people as an ingredient in making wine bitters.

In Lithuania, the root is preserved with sugar-like angelica.

The young and tender inflorescence is often eaten by children for its sweetness. In Holland, children use the rhizomes as chewing-gum and also make pop-gun projectiles of them.

The aroma that makes the leaves attractive to us, renders them distasteful to cattle, who do not touch the plant.

There is a seventeenth-century reference to broth 'flavoured with Angelica seed and *Calamus*.'

An extract from Salmon's *Herbal* (1710), giving no less than sixteen different preparations of Calamus, will show in how much greater esteem it was held in former days:

'It is a good stimulant and carminative. The preparations: The root only is of use, and you may have therefrom 1, A liquid Juice. 2, An Essence. 3, An Infusion of Wine. 4, A Decoction in Wine. 5, A Powder. 6, A Cataplasm. 7, A spirituous Tincture. 8, An acid Tincture. 9, An oily Tincture. 10, A Spirit. 11, A chemical Oil. 12, Potestates or

Powers. 13, An Elixir. 14, A Collegium. 15, A Preserve. 16, A Syrup. The Liquid Juice, No. 1, was said "to prevail against the bitings of mad dogs and other venomous creatures." It is a peculiar thing against poison, the Plague and all contagious diseases.'

Culpepper says:

'The spicy bitterness of the root of this plant (which he calls the Bastard Flag) bespeaks it as a strengthener of the stomach and head and therefore may fitly be put into any composition of that intention. The root preserved may with good success be used by itself. The leaves, having a very grateful flavour, are by some nice cooks put into sauce for fish.'

Adulterations

The rhizome of the Common Yellow Flag (*Iris pseudacorus*) is sometimes mixed with those of the Sweet Flag, when collected in this country, but is readily detected by its darker colour, different structure and want of aromatic odour and taste.

Calamus Draco (Willd.) (*Daemonorops Draco*, Martius) is a slender palm of the East Indies, yielding the resin 'Dragon's Blood,' obtained from the fruit, used in former times as a mild astringent in diarrhoea, but now never given internally. It was formerly an ingredient of many plasters.

At present, it is mainly used as a colouring agent in pharmacy and the arts, to colour tooth-powders, tinctures and plasters and to impart a mahogany colour to varnishes and wood stains.

The term 'Dragon's Blood' has also been applied to the resin of *Dracaena draca* (Socotra), *Pterocarpus Draco* (West Indies) and *Croton Draco*.

OTHER SEDGES

N.O. Araceae

The Sedge family is of comparatively slight economic importance. The plants are distinguished from the true Grasses, which they closely resemble, by their solid stems, leafsheaths which are not connate, and the presence of but a single scale to each flower.

They are mostly coarse, harsh and indigestible, and not adapted for food purposes, though the rhizomes of several have been utilized as starchy foods.

Quite a number possess volatile oils and aromatic principles, while others are rich in astringents - chiefly the species indigenous to India and China.

Among the more important aromatics and carminatives are *Cyperus sanguinea-fuscus* (Nees), the Cure-pire of Paraguay, *C. elegans* (Rottb.) of Mexico; *C. pertenuis* (Roxb.), the Indian Nagar-motha or Koriak, whose roots, when dried and powdered, are used by the Indian ladies for perfuming their hair; and *C. tegetum* (Roxb.); *Adrue*

or *Guinea Rush* is the rhizome of *C. articulatus* (Linn.), which, besides being used as a carminative, has a high repute in the East Indies for anti-emetic properties. The blackish tubers have a somewhat bitter, aromatic taste, resembling that of Lavender. A fluid extract is prepared from them used in herbal medicine. The aromatic properties of the drug cause a feeling of warmth to be diffused throughout the system and act as a sedative in dyspeptic disorders. It is common also in Jamaica and on the banks of the Nile.

Two Indian species of Sedge, *C. rotundus* and *C. scariosus*, also possess fragrant roots, largely employed in Eastern perfumes, but they are little used in Europe.

The tubers of *C. hexastachys* are said to be successfully used by Hindu practitioners in cases of cholera. They call the plant 'Mootha.'

The tubers of *C. bulbosus* are said to taste like potatoes when roasted, and would be valuable for food if they were bigger.

The root of *C. odoratus* has a warm, aromatic taste, and is given in India in infusions as a stomachic.

The roots of the Sweet Cyperus or English Galingale (*C. longus*, Linn.) were once esteemed as an aromatic tonic, considered good as a stomachic and serviceable in the first stages of dropsy, but they have now fallen into disuse. This species is a native of France, Germany, Italy and Sicily, but very rare in this country, being only found in a few places in Dorsetshire and Wales. The plants throw up erect triangular stems, about 2 feet high, bearing three long, channelled, drooping leaves and a lax, compound umbel of flat flower-spikes, which renders it very ornamental when in flower.

C. esculentus is a native of Italy and Sicily and the Levant. Its roots are fibrous, with small round tubers hanging from them, of the size of peas, which taste like sweet filberts and are eaten in Italy, and sold in the markets.

The French call the tubers *Souchet comestible* or *Amande de terre*.

C. Papyrus is the Egyptian Papyrus, the fibrous stems of which provided the earliest form of paper known.

This plant had various economic uses, as Pliny and other writers have shown, though as the Egyptians cultivated other Sedges, it is probable that these became more exclusively used for food and fuel, sails and cordage, baskets and sieves, not to speak of punts or canoes to which the prophet Isaiah refers (Isaiah xviii. 2), where the Ethiopians are spoken of as sending ambassadors by the sea even in *vessels of bulrushes* upon the waters (the Hebrew word is *gome*). The papyrus was, in ancient times, carefully cultivated, especially in certain districts of Lower, and probably of Upper Egypt also, for the great and important purpose with which its name must ever be associated.

For this manufacture the rind was removed, the pith cut in strips and laid lengthwise on a flat board, their edges united by some glue or cement (Pliny says 'Nile water'),

and the whole subjected to pressure, compacting the several strips into one uniform fabric. This material was well known to the Ancients, and continued to be used in Europe until the time of Charlemagne, when it was superseded by parchment. It is remarkable that although we have no trace in Scripture of the use of papyrus or other vegetable substance by the Jews for writing purposes, the plant has been found to exist in vast quantities in the Lake Merom at the northern end of the Lake of Tiberias, and in some of the streams which flow into the Mediterranean.

On the other hand, it has disappeared from Egypt, where it once grew in quantity. It is also grown in Sicily and Sardinia, but on a limited scale.

Of the Papyrus, or some allied species of Sedge, Heliodorus relates that the Ethiopians made swift-sailing wherries, capable of carrying two or three men; and the traveller Bruce refers to a similar use of this ancient plant among the modern Abyssinians.

Other writers give similar testimony, and it is highly probable that such light vessels were coated with bitumen, like the rude basket made by Jochabed for the infant Moses (Exod. ii. 3).

The stems of the Papyrus were likewise used for ornamenting Egyptian temples, and crowning the statues of their gods.

This plant, if grown in Britain, requires the aid of a stove to grow it properly, and then it must have a good supply of water.

Scirpus lacustris, the Great Club-Rush or Common Bulrush, is used for making chair seats, mats and hassocks, being imported dried, in large bundles from Holland. The roots are astringent and diuretic and were formerly employed in medicine, but are now no longer used.

S. capillaris is used in Spanish America under the name of Espartillo, as a pectoral.

Other British species are the chocolateheaded Club-Rush (*S. pauciflorus*), Deer'shair (*S. coespitosus*), Dwarf Club-Rush (*S. nanus*), Floating Mud-Rush (*S. fluitans*), Savi's Mud-Rush (*S. cernuus*), Bristle-like Mud-Rush (*S. saetaceus*), Round-headed Mud-Rush (*S. Holoschoeus*), and eight others of the genus *Scirpus*.

Kyllingia monocephala is used in Paraguay as a substitute for Calamus.

Carex arenaria (Linn.), the Sand Sedge, is a familiar seaside species of Sedge, which is very widely distributed and common on sandy coasts, growing on sand-dunes and elsewhere at high-water mark, amongst grasses and herbage, helping to bind it together.

The plant is perennial, propagating itself rapidly in loose sand, on which account it is planted on dykes in Holland for the purpose of binding the sand by means of its long and interlacing underground stems, which penetrate horizontally about 4 inches below the surface, thus helping to prevent the incursions of the sea. It has been used for this purpose also on the British East Coast.

The rhizomes have been used medicinally in Germany as a substitute for Sarsaparilla, in the same way that Couch Grass is here employed, having diuretic and sudorific properties.

C. vulpinoides, an allied species to *C. vulpina* (Great or Fox Sedge), is a North American plant, but has been found on the banks of the Thames near Kew.

There are sixty-nine species of *Carex* given by Johns (*Flowers of the Field*), besides those mentioned above; some only grow in Scotland, and none have medicinal or practical uses.

Eriophorum angustifolium (Cotton Grass), with its long white tufts of hair, is very decorative on our bogs and mosses in the middle of summer. The down is used in moorland districts for stuffing pillows, and attempts have been made to employ it as a substitute for cotton, under the name of 'Arctic Wool,' thread having been spun from it, but the fibres are more brittle than those of cotton and do not bear twisting as well. Candles and lamp wicks have been made from the down by country people.

In former days the leaves and roots had some reputation in northern countries as a medicine in diarrhoea, as like most members of the Sedge family, they possess considerable astringency.

The name *Eriophorum* is from the Greek *erion* (wool) and *phero* (I bear).

Culpepper approved of the use of 'Bulrushes' and 'some of the smoother sorts,' but considered they should be 'given with caution,' as they were apt to 'cause head-ache, and provoke sleep. The root, boiled in water, to the consumption of one-third, helps the cough.'