

= Parsnip =

The parsnip ( *Pastinaca sativa* ) is a root vegetable closely related to the carrot and parsley . It is a biennial plant usually grown as an annual . Its long , tuberous root has cream @-@ colored skin and flesh ; and left in the ground to mature , it becomes sweeter in flavor after winter frosts . In its first growing season , the plant has a rosette of pinnate , mid @-@ green leaves . If unharvested , it produces its flowering stem , topped by an umbel of small yellow flowers , in its second growing season . By this time , the stem is woody and the tuber is inedible . The seeds are pale brown , flat , and winged .

The parsnip is native to Eurasia . It has been used as a vegetable since antiquity and was cultivated by the Romans , although some confusion exists in the literature of the time between parsnips and carrots . It was used as a sweetener before the arrival in Europe of cane sugar . It was introduced into the United States in the 19th century .

The parsnip is usually cooked , but can also be eaten raw . It is high in vitamins and minerals , especially potassium . It also contains antioxidants and both soluble and insoluble dietary fiber . It can be cultivated in deep , stone @-@ free soils . It is attacked by the carrot fly and other insect pests , viruses , and fungal diseases , of which canker is the most serious . Handling the stems and foliage can cause a skin rash if the skin is exposed to sunlight after handling .

= = Description = =

The parsnip is a biennial plant with a rosette of roughly hairy leaves that has a pungent odor when crushed . Parsnips are grown for their fleshy , edible , cream @-@ colored taproots . The roots are generally smooth , although lateral roots sometimes form . Most are cylindrical , but some cultivars have a more bulbous shape , which generally tends to be favored by food processors as it is more resistant to breakage . The plant 's apical meristem produces a rosette of pinnate leaves , each with several pairs of leaflets with toothed margins . The lower leaves have short stems , the upper ones are stemless , and the terminal leaves have three lobes . The leaves are once- or twice @-@ pinnate with broad , ovate , sometimes lobed leaflets with toothed margins ; they grow up to 40 cm ( 16 in ) long . The petioles are grooved and have sheathed bases . The floral stem develops in the second year and can grow to more than 150 cm ( 60 in ) tall . It is hairy , grooved , hollow ( except at the nodes ) , and sparsely branched . It has a few stalkless , single @-@ lobed leaves measuring 5 to 10 cm ( 2 to 4 in ) long that are arranged in opposite pairs .

The yellow flowers are in a loose , compound umbel measuring 10 to 20 cm ( 4 to 8 in ) in diameter . Six to 25 straight pedicels are present , each measuring 2 to 5 cm ( 1 to 2 in ) that support the umbellets ( secondary umbels ) . The umbels and umbellets usually have no upper or lower bracts . The flowers have tiny sepals or lack them entirely , and measure about 3 @.@ 5 mm ( 0 @.@ 14 in ) . They consist of five yellow petals that are curled inward , five stamens , and one pistil . The fruits , or schizocarps , are oval and flat , with narrow wings and short , spreading styles . They are colored straw to light brown , and measure 4 to 8 mm ( 0 @.@ 16 to 0 @.@ 31 in ) long .

Despite the slight morphological differences between the two , wild parsnip is the same taxon as the cultivated version , and the two readily cross @-@ pollinate . Parsnip has a chromosome number of  $2n = 22$  .

= = History = =

Like carrots , parsnips are native to Eurasia and have been eaten there since ancient times . Zohary and Hopf note that the archaeological evidence for the cultivation of the parsnip is " still rather limited " , and that Greek and Roman literary sources are a major source about its early use . They warn that " there are some difficulties in distinguishing between parsnip and carrot ( which , in Roman times , were white or purple ) in classical writings since both vegetables seem to have been sometimes called *pastinaca* , yet each vegetable appears to be well under cultivation in Roman times " . The parsnip was much esteemed , and the Emperor Tiberius accepted part of the tribute

payable to Rome by Germany in the form of parsnips . In Europe , the vegetable was used as a source of sugar before cane and beet sugars were available . As *pastinache comuni* , the " common " *pastinaca* figures in the long list of comestibles enjoyed by the Milanese given by Bonvesin da la Riva in his " *Marvels of Milan* " ( 1288 ) .

This plant was introduced to North America simultaneously by the French colonists in Canada and the British in the Thirteen Colonies for use as a root vegetable , but in the mid @-@ 19th century , it was replaced as the main source of starch by the potato and consequently was less widely cultivated .

In 1859 , a new cultivar called ' Student ' was developed by James Buckman at the Royal Agricultural College in England . He back @-@ crossed cultivated plants to wild stock , aiming to demonstrate how native plants could be improved by selective breeding . This experiment was so successful , ' Student ' became the major variety in cultivation in the late 19th century .

#### = = Taxonomy = =

The parsnip was first officially described by Carolus Linnaeus in his 1753 work *Species Plantarum* . It has acquired several synonyms in its taxonomic history :

*Pastinaca fleischmannii* Hladnik , ex D.Dietr.

*Pastinaca opaca* Bernh. ex Hornem .

*Pastinaca pratensis* ( Pers . ) H.Mart.

*Pastinaca sylvestris* Mill .

*Pastinaca teretiuscula* Boiss .

*Pastinaca umbrosa* Steven , ex DC .

*Pastinaca urens* Req. ex Godr .

Like most plants of agricultural importance , several subspecies and varieties of *P. sativa* have been described , but these are mostly no longer recognized as independent taxa , but rather , morphological variations of the same taxon .

*P. s.* subsp. *divaricata* ( Desf . ) Rouy & Camus

*P. s.* subsp. *pratensis* ( Pers . ) ?elak .

*P. s.* subsp. *sylvestris* ( Mill . ) Rouy & Camus

*P. s.* subsp. *umbrosa* ( Steven , ex DC . ) Bondar. ex O.N.Korovina

*P. s.* subsp. *urens* ( Req. ex Godr . ) ?elak .

*P. s.* var. *brevis* Alef .

*P. s.* var. *edulis* DC .

*P. s.* var. *hortensis* Ehrh. ex Hoffm .

*P. s.* var. *longa* Alef .

*P. s.* var. *pratensis* Pers .

*P. s.* var. *siamensis* Roem . & Schult. ex Alef .

In Eurasia , some authorities distinguish between cultivated and wild versions of parsnips by using subspecies *P. s. sylvestris* for the latter , or even elevating it to species status as *Pastinaca sylvestris* . In Europe , various subspecies have been named based on characteristics such as the hairiness of the leaves , the extent to which the stems are angled or rounded , and the size and shape of the terminal umbel .

The etymology of the generic name *Pastinaca* is not known with certainty , but is probably derived from either the Latin word *pastino* , meaning " to prepare the ground for planting of the vine " or *pastus* , meaning " food " . The specific epithet *sativa* means " sown " .

#### = = Uses = =

Parsnips resemble carrots and can be used in similar ways , but they have a sweeter taste , especially when cooked . They can be baked , boiled , pureed , roasted , fried , or steamed . When used in stews , soups , and casseroles , they give a rich flavor . In some cases , parsnips are boiled and the solid portions are removed from the soup or stew , leaving behind a more subtle flavor than

the whole root , and starch to thicken the dish . Roast parsnip is considered an essential part of Christmas dinner in some parts of the English @-@ speaking world and frequently features in the traditional Sunday roast . Parsnips can also be fried or thinly sliced and made into crisps . They can be made into a wine with a taste similar to Madeira .

In Roman times , parsnips were believed to be an aphrodisiac . However , parsnips do not typically feature in modern Italian cooking . Instead , they are fed to pigs , particularly those bred to make Parma ham . In traditional Chinese medicine , the root of Chinese parsnip is used as a herbal medicine ingredient .

#### = = Nutritients = =

A typical 100 @-@ g parsnip contains 75 Calories ( 230 kJ ) of energy . Most parsnip cultivars consist of about 80 % water , 5 % sugar , 1 % protein , 0 @.@ 3 % fat , and 5 % dietary fiber . The parsnip is rich in vitamins and minerals , and is particularly rich in potassium with 375 mg per 100 g . Several of the B @-@ group vitamins are present , but levels of vitamin C are reduced in cooking . Since most of the vitamins and minerals are found close to the skin , many will be lost unless the root is finely peeled or cooked whole . During frosty weather , part of the starch is converted to sugar and the root tastes sweeter .

The consumption of parsnips has potential health benefits . They contain antioxidants such as falcarinol , falcarindiol , panaxydiol , and methyl @-@ falcarindiol , which may potentially have anticancer , anti @-@ inflammatory and antifungal properties . The dietary fiber in parsnips is partly of the soluble and partly the insoluble type and comprises cellulose , hemicellulose , and lignin . The high fiber content of parsnips may help prevent constipation and reduce blood cholesterol levels .

#### = = Etymology = =

While folk etymology sometimes assumes the name is a portmanteau of parsley and turnip , it actually comes from Middle English pasnepe , alteration ( influenced by nep , turnip ) of Old French pasnaie ( now panais ) from Latin pastinum , a kind of fork . The word 's ending was changed to -nip by analogy with turnip because it was mistakenly assumed to be a kind of turnip .

#### = = Cultivation = =

The wild parsnip from which the modern cultivated varieties were derived is a plant of dry rough grassland and waste places , particularly on chalk and limestone soils . Parsnips are biennials , but are normally grown as annuals . Sandy and loamy soils are preferable to silt , clay , and stony ground ; the latter produces short , forked roots . Parsnip seed significantly deteriorates in viability if stored for long . Seeds are usually planted in early spring , as soon as the ground can be worked to a fine tilth , in the position where the plants are to grow . The growing plants are thinned and kept weed @-@ free . Harvesting begins in late fall after the first frost , and continues through winter . The rows can be covered with straw to enable the crop to be lifted during frosty weather . Low soil temperatures cause some of the starches stored in the roots to be converted into sugars , giving them a sweeter taste .

#### = = Cultivation problems = =

Parsnip leaves are sometimes tunnelled by the larvae of the celery fly ( *Euleia heraclei* ) . Irregular , pale brown passages can be seen between the upper and lower surfaces of the leaves . The effects are most serious on young plants , as whole leaves may shrivel and die . Treatment is by removing affected leaflets or whole leaves , or by chemical means .

The crop can be attacked by larvae of the carrot fly ( *Chamaepsila rosae* ) . This pest feeds on the outer layers of the root , burrowing its way inside later in the season . Seedlings may be killed while larger roots are spoiled . The damage done provides a point of entry for fungal rots and canker . The

fly is attracted by the smell of bruised tissue .

Parsnip is used as a food plant by the larvae of some lepidopteran species , including the parsnip swallowtail ( *Papilio polyxenes* ) , the common swift moth ( *Korscheltellus lupulina* ) , the garden dart moth ( *Euxoa nigricans* ) , and the ghost moth ( *Hepialus humuli* ) . The larvae of the parsnip moth ( *Depressaria radiella* ) , native to Europe and accidentally introduced to North America in the mid @-@ 1800s , construct their webs on the umbels , feeding on flowers and partially developed seeds .

Parsnip canker is a serious disease of this crop . Black or orange @-@ brown patches occur around the crown and shoulders of the root accompanied by cracking and hardening of the flesh . It is more likely to occur when seed is sown into cold , wet soil , the pH of the soil is too low , or the roots have already been damaged by carrot fly larvae . Several fungi are associated with canker , including *Phoma complanata* , *Ilyonectria radicola* , *Itersonilia pastinaceae* , and *I. perplexans* . In Europe , *Mycocentrospora acerina* has been found to cause a black rot that kills the plant early . Watery soft rot , caused by *Sclerotinia minor* and *S. sclerotiorum* , causes the taproot to become soft and watery . A white or buff @-@ colored mold grows on the surface . The pathogen is most common in temperate and subtropical regions that have a cool wet season .

Violet root rot caused by the fungus *Helicobasidium purpureum* sometimes affects the roots , covering them with a purplish mat to which soil particles adhere . The leaves become distorted and discolored and the mycelium can spread through the soil between plants . Some weeds can harbour this fungus and it is more prevalent in wet , acid conditions . *Erysiphe heraclei* causes a powdery mildew that can cause significant crop loss . Infestation by this causes results in yellowing of the leaf and loss of foliage . Moderate temperatures and high humidity favor the development of the disease .

Several viruses are known to infect the plant , including seed @-@ borne strawberry latent ringspot virus , parsnip yellow fleck virus , parsnip leafcurl virus , parsnip mosaic potyvirus , and potyvirus celery mosaic virus . The latter causes clearing or yellowing of the areas of the leaf immediately beside the veins , the appearance of ochre mosaic spots , and crinkling of the leaves in infected plants .

= = Toxicity = =

While the root of the parsnip is edible , handling the shoots and leaves of the plant requires caution as the sap is toxic . Like many other members of the family *Apiaceae* , the parsnip contains furanocoumarins as a defense against herbivory , photosensitive chemicals that causes a condition known as phytophotodermatitis . The condition is a type of chemical burn rather than an allergic reaction , and is similar to the rash caused by poison ivy ( *Toxicodendron radicans* ) . Symptoms include redness , burning , and blisters ; afflicted areas can remain discolored for up to two years . Although some reports of gardeners experiencing toxic symptoms after coming into contact with foliage have been made , these have been small in number compared to the number of people who grow the crop . The problem is most likely to occur on a sunny day when gathering foliage or pulling up old plants that have gone to seed . The symptoms have mostly been mild to moderate .

The toxic properties of parsnip extracts are resistant to heating , or a storage period of several months . Toxic symptoms can also affect livestock and poultry in parts of their bodies where their skin is exposed . Polyynes can be found in *Apiaceae* vegetables such as parsnip , and they show cytotoxic activities .

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= = = General = = =

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