



Apples and Roses
Prunes and Pears

by Susan McDougall

THE BEAUTIFUL, EDIBLE ROSE



The hips of the shrubby Wood's Rose (*Rosa woodsii* var. *ultramontana*).

eating or perhaps saucing; at a glance it appears to bear little resemblance to the hardened hip.

Nevertheless the two are closely related. The tasty apple, the succulent prune, the odd-shaped pear, the round, mouth-watering cherry -- all are roses. Technically, they belong to the Rosaceae, a large family that dates back to about 100 million years ago and is most diversified in the Northern Hemisphere. The family includes about 3,000 species and countless cultivars. Most northern gardens will probably have at least one family member and often more.

The garden rose and orchard apple may appear to have little in common, but it is in the flowers and the packed seeds that the similarities between them becomes clear. The edible, cushy part is an add-on, simply an expansion of a part also present in the rose hip. Named the hypanthium, the structure surrounds the developing seeds. In one case it is thin and hard, in the other thick and juicy. Sometimes the expanded hypanthium weighs more than a pound, with the fruit inches in diameter, but in more ancient lineages the apple may be barely an inch across. These are the "crabs", tiny apples that have also been developed by human tweaking, often for the showy flowers as much as the fruit.

Within the shiny "hips" of the North American native Wood's Rose pictured here are several little black seeds, encased in thin, hard covers. The annual product of successful pollination, and the absorption of energy, nutrients, and water required to ripen them, the seeds carry within the beginnings of the next generation. The flowers are long withered, and the hips only need fall to bring the seeds into close contact with the ground. Most of them will not germinate, and so the plant must expend energy in the production of many seeds.

If picked and placed in boiling water, the hips make a fragrant, light tea, but in spite of the attractiveness of the fruit, they are not particularly edible. They are hard, with little substance. Yet in a grocery store only a few miles distant a close relative of the Woodland Rose offers something much sweeter. And, thanks to hundreds of years of careful selection and cultivation by human endeavors, a large fruit ready for picking from a

tended tree. The destiny of the apple is for



A native rose with many stamens and pistils, the necessary parts for the production of "hips" - Nootka Rose (*Rosa nutkana* ssp. *macdougalii*)

THE BEAUTIFUL, EDIBLE ROSE

The separation of plants into families depends to a great extent on the structure of the flower; in particular, its reproductive parts. Other factors include the petals, the bracts that surround them, the form of the seed, and the arrangement of the leaves. Members of the Rose Family (the Rosaceae) are distinguished in this manner, and thus photos of the flower should reveal the similarity between roses and apples. However, what is apparent to the eye may nevertheless mask other differences, and at one time botanists did place apples and roses in different families. Today's authorities divide them by genus (apples are *Malus*, roses are *Rosa*) that reflects other characteristics, but at the family level, certain common features are recognized. Superficially, the resemblance between a rose blossom and an apple is apparent with a close look. Showy roses (such as the cultivated Tea Roses) may be more difficult--the big flashy petals tend to hide the inner structure, at least until the flower matures -- but apples and native roses are surprisingly similar. They seem to differ more in the fruit than in the flower.



Reinette Gris apple - an old cultivar



Clustered Rose or Apple?



**The reproductive parts of the native Nootka Rose -
Rosa nutkana ssp. *macdougalii***

Rose Family members are primarily temperate climate plants, and for the most part are absent from deserts and warm tropical regions. The family is distributed worldwide and it is large, with approximately 3,000 members and 88 genera. Flowers may be borne as solitary individuals or in various clusters, some with many flowers. Fruit types vary but are considered important to identifying and separating the roses. The family is old, which may account for some of the many species. At one time the family was considered larger, but recent molecular studies have led to the current definition.

THE BEAUTIFUL, EDIBLE ROSE

THORNS, SEEDS, AND OTHER PARTS

For anyone who has pruned roses or had a close encounter with a stem while enjoying the fragrance of a blossom, another common feature of Rose Family plants is sometimes immediately apparent. The stems are thorny, sometimes viciously so, and quite capable of drawing blood from the finger or imparting scratches on the arm. The closely related native roses (same genus - *Rosa*) bear thorns as well, although they are smaller than those of the big cultivated garden varieties. And the delicious raspberries (also a Rose Family member) can also extract a price, although likely a scratch than a cut.

Yet the apple trees appear thornless. The thorns, if present at all, seem invisible. Do these tree-sized relatives, with their stout trunk and multiple branches, go unprotected? Yes--and no. The large fruit-bearing apples may lack thorns in selection process, but other trees in the family, such as the hawthorns are not so defenseless, and native crabapples may bear thorns; the European crab apple, *Malus sylvestris* is armored in this way.

Apple seeds contain amygdalin, a chemical that releases cyanide when the seeds are chewed. Poisoning from the seeds is certainly rare, but the cyanide itself, in sufficient quantity is deadly. Apples are not the only Rose Family seeds that contain this cyanide-releasing substance. Peaches, apricots, and cherries are also poisonous. However, it would require the consumption of a lot of apple seeds to produce a lethal dose, although since an individual may react outside the "norm", eating the seeds is not advised in any quantity.



**Redthorn Rose - *Rosa sericea* var.
pteracantha
Beautiful and formidable**



**Oceanspray - *Holodiscus discolor*
Hundreds of small flowers create a striking
display**

Unlike the seeds, rose petals are decorative items for many desserts, and can be candied to make them sweeter, adding color and taste. Rose essence, a liquid form made from the petals is used as a natural flavoring in such famous concoctions as Turkish Delight, a speciality that can take up to eight days of storage before eating. Rose petal recipes are available by the hundreds on the Internet: petals flavor marshmallows, puddings, custards, jams - the list goes on and on.

The form of a Rose Family species can vary from the lowliest vine to a tree over a hundred feet tall. Creeping strawberries subtly expand their range with long runners. More easily seen at eye level, shrubby members are often quite spectacular when in flower; the showy Ocean spray (*Holodiscus discolor*), a

THE BEAUTIFUL, EDIBLE ROSE



Toyon - *Heteromeles arbutifolia*
Evergreen rose with bright red berries

widespread western shrub, bears small flowers and large clusters; hundreds of these robust plants can line hillsides and ocean bluffs. The evergreen Toyon (*Heteromeles arbutifolia*) is a California species, easily recognized by its evergreen leaves and bright fruit. Toyon berries are important forage for birds in some regions, even though they are not as nutritious as seeds. Cedar Waxwings, American Robin, and Hermit Thrush are all known to visit Toyon shrubs and consume quantities of the fruits.

Also adapted to a range of habitats, numerous herbaceous species brighten the forest and open countryside and are excellent for the garden, requiring little care and often flowering for an extended season or coming into bloom multiple times during the summer. Selections of a range of colors and flower size expand the appeal and suitability of these smaller plants. Shown in the photograph here is Largeleaf avens (*Geum macrophyllum*), a temperate species with a range across the continent and demonstrate a tolerance for sunny and shady conditions;

the flowers on tall stems add bright spots to a garden. In its native range, the related Prairie smoke (*Geum triflorum*), bears flowers with grows on dry sites in sunny locations.



Prairie smoke - *Geum triflorum*
Tolerant of dry conditions



Largeleaf avens - *Geum macrophyllum*
Native perennial

THE BEAUTIFUL, EDIBLE ROSE



**Apple Orchard in spring -- eastern Washington State
The trees bloom after the related cherries**

bringing the trees with them, but prior to this introduction development of new types had gone on for thousands of years in the Old World. Introduction of cultivated apples to America did not mean the end of the experimentation for improved apples, new types often further removed from an ancestor long forgotten. And although the development of new varieties has been ongoing, not all are destined for



'Pumpkin Pie', a cultivated crabapple

the orchard, as ultimate survival depends as much on customer reaction to taste and color as it does to other attributes. Preferences change, and selection today may be based on qualities given little consideration in the past.

APPLES

Members of the *Malus* genus, the orchard apples are descendents of a species native to central Asia (*Malus sieversii*) which may have hybridized with other wild species. Over the centuries, more than 10,000 cultivars have been developed, parents to apples far enough removed from the original species to be considered descendents of the domestic apple, *Malus domestica*. Cultivars were selected and propagated for fruit size, crispness, keeping qualities, disease resistance and visual appeal. Today approximately 100 are grown commercially.

Apples reached North America when European colonists came to the continent,



Akane Apple, developed in the early twentieth century as a cross between Jonathan and Worcester Permain. Both parents are descendents of earlier cultivars; Jonathan was discovered as a seedling in the nineteenth century. Evidence of the dried blossom is apparent at the rounded end, opposite the stem.

THE BEAUTIFUL, EDIBLE ROSE

Growing apples is big business, in which huge orchards flow like a seasonal wave of white, green, and red and yellow over thousands of acres. An orchard can be stunning in springtime, and with its load of



A beautiful native crabapple - *Malus angustifolia*

fruits, tempting in autumn. In apple country the local residents look forward to the ripening of the fruit, while in more distant places customers search supermarkets and local stores alike for the yearly crop. The desirability of a fresh apple, and the sweetness of its various products is evidenced in its popularity. Apple production in the United States alone exceeds 11 billion tons in a year.

The apple varieties brought by European colonists were planted in a land already home to native members of the *Malus* genus. The fruits of these trees were much smaller than the newcomers, but the shape and taste were unmistakable. These were the crabapples, and to the pioneering Europeans, their presence offered an opportunity. For although the crabapple fruits were small, they could be harvested for jellies and jams, and to the future orchardist, they would serve as pollinators for the trees that bore commercial fruit.

Native crabapple blossoms can be quite beautiful. The cotton candy pink of the Southern Crabapple (*Malus angustifolia*) blossom certainly rivals that of any other apple. Never common but widely distributed, this small tree is sometimes seen at forest edges where the flowers add spots of color to the masses of springtime leaves of the neighboring trees.

Crabapples have also been subjected to diversification through selective breeding practices, and many are available to the gardener. Blossom color may range from nearly pure white to deep pink, and the autumn apples are various hues of yellow, red, deep maroon.

Countless apple cultivars have been developed over the years, some of which were destined to the compost heap, and others that would retain a lasting popularity. Relative newcomers such as Honey Crisp were selected from other cultivars, while the old favorite Delicious was a "discovered" apple, the original tree with its load of exceptional fruit found growing amongst other less productive trees. Other apples popular today were also exceptional seedlings of older varieties, such as Jonathan, discovered in 1826 as a cultivar of an old and popular selection itself-- the 'Esopus Spitzenburg'. Many of these cultivars were destined for commercialization, the results being evident in the acres of apple trees grown where conditions are favorable. All of them ultimately descend from a single Asian native, but none of them can be perfectly traced back to that tree. Even the oldest known cultivars are centuries removed.

This does not detract from the interest of the older cultivars, and efforts are made to preserve these varieties. However, many have disappeared from production and often from gardens as well. Not as tasty or as productive as newer types, the stories of the vanished trees may be lost with them. By comparison to

THE BEAUTIFUL, EDIBLE ROSE

the thousands of acres given over to production of a single variety, the places where they remain are few in number and size, and a visit to an orchard dedicated to the more historic types is indeed a step back in time, and can provide an opportunity for discovery into the history of the cultivated apple. Such a place is the Seed Savers Farm in Decorah, Iowa, a farm whose purpose is the preservation of diversity present in the world of edible plants. Historic vegetables and fruits alike - sometimes those found in old gardens or a family patch - receive the attention rarely given to the older varieties. It is perhaps surprising that large scale farming typically results in a reduction of diversity where the link to the past is most often obscured by the realities of production by the ton. Here the goal is size, taste, disease resistance and the most easily marketable-- these may have also been objectives in the past, but the scale was much smaller, and many varieties survived the culling.

The English Codling apple is one such old variety. The word 'Codling' has a complex history and apparently isn't the same as 'coddle' which may refer to cooking, or to nurturing, as with a child. A codling apple is either a small apple that requires cooking, or a specific variety, as with the English Codling. The confusion in the meaning of the words reflect the possibility of two origins to the word, and an old origin. English Codling is still available for purchase and is a green apple with a white flesh and excellent flavor when cooked.

Most of the cultivated apples today are propagated by grafting, and the value of the yearly apple crops is in the billions of dollars. The native species from which these cultivars are descended is still grown in Asia. The apples of this species are up to three inches in diameter, as large as many cultivars, but the primary interest in the species is its disease resistance, and the possible development as well of cultivars resistant to cold; the tree grows in a mountainous habitat. Although once locally common, *Malus sieversii* is now considered threatened in its native range due at least in part to increasing agricultural development and competition from conversion to grazing. The genetic diversity of this ancient species has led to renewed interest in its propagation and utilization in the development of new varieties.



The English Codling Apple - grown at Seed Savers Farm

THE BEAUTIFUL, EDIBLE ROSE

HAWTHORNS

A widely-dispersed relative with a treelike form that resembles an apple, except that the leaves are usually shallowly lobed and pointed, answers the question with a common name -- the hawthorn. Many hawthorns reveal their appropriate name with very nasty thorns that stick out like some kind of dare from the branches. Members of the *Crataegus* genus, as with the crabapples, they are beautiful in springtime when a dense covering of white to pink flowers transforms them from blackened winter limbs and twigs to a cloud of pale color. Not all of them are defended with thorns, but many can draw blood from the inquisitive hand of a human or the soft lips of a herbivore. Clearly the thorns are defensive in nature. What is unclear is why some are thornless while others are well-armed.

"Haw" probably comes from an old word meaning "hedge", and "thorn" is self-explanatory, although the physical origin of the thorn may not be as obvious. A thorn is actually a modified stem, without leaves. In the spring, new soft, greener growth can often be seen on the branches, as the new thorns begin to form, sometimes with abortive leaves. As the hardening thorn matures, there can be little question that it is a defensive mechanism.

Whereas the crabapple species number only about ten in North America, the hawthorn species are much more numerous, and although there may be some disagreement, with most experts placing the number of species at about 200, what is recognized is that *Crataegus* is what is known as an apomictic genus. Most common in a few plant families, including the rose family, apomixis is recognized as a reproductive method that is asexual--without fertilization--in which the new plant is identical to the parent. The offspring is a clone, although it is generated from a side, not a branch or twig. Most genera that employ this cloning method also reproduce sexually.

Although the apomictic method in its various forms is understood, what is less apparent is the reason for such a reproductive mechanism. And why would it be evident in one tree genus (the *Crataegus*) but not the other (the *Malus*)? One possible reason suggests itself by noting that grasses (family Poaceae) also employ this method. Grasses often appear to grow in a very constant habitat; for example, large open spaces of similar conditions in terms of soil, rain, drainage. There would be an advantage to reproducing identical offspring to take advantage of this apparent constant habitat. Perhaps the same is true for certain Rose Family members as well. It may be that evolution has produced a mechanism that humans have long copied and continue to do so at an accelerating pace. A



Downy Hawthorn - *Crataegus mollis*
A large specimen of a Midwestern hawthorn.

THE BEAUTIFUL, EDIBLE ROSE

monoculture is a long-standing model for agriculture. Fields of identical plants, forests of the same; it is a goal, not an accident of nature. This seems like human-engineered apomixis at work.

The native Hawthorns tend to like generous amounts of sun, although some tolerate shade, and they also require sufficient rainfall to prevent drying out. Thus in drier areas, such as the Great Plains they often grow near watercourses. Of course, sufficient water is a general requirement for trees, but there are other roses that are more drought tolerant, ones that may nearly reach tree size proportions.

In North America both the thornless (in spite of the name not all hawthorns bear thorns) and thorny are found in a variety of habitats. As with the crabapples, hawthorns are planted for the showy flowers, which are, unfortunately, not as sweetly scented as other roses, and the fruits resemble a small



The formidable thorns and apple-like blossoms of *Crataegus crus-gallii*, a native Hawthorn. A fresh, developing thorn can be seen on the right.

aptly named Cockspur Hawthorn (*Crataegus crus-gallii*). Two inches or more in length, these modified stems can draw blood from the thickest skin. By contrast, the flowers are as lovely as any diminutive rose, and the pink-tipped stamens are cheery. Cockspur Hawthorn is a widely-ranging native east of the Rockies, growing north to Canada, west to Texas, and south to Florida.

crabapple. They are not particularly tasty, although some cultures have made use of them in a variety of treats, and it is said that fresh leaves are quite good.

Some hawthorns have hard and durable wood that has been used in the past for fence posts and tool handles. Trees have been reduced to shrubs for use as hedges, while the trees are planted as street trees and in garden settings.

The thorns of some hawthorns can be very formidable. One particularly offputting tree is the



Fruits and thorns of *Crataegus crus-gallii*. The numerous dark red fruit makes this hawthorn quite showy in autumn.

THE BEAUTIFUL, EDIBLE ROSE

STRAWBERRIES

At the local fresh produce market, an eye-candy red fruit, grouped in transparent plastic boxes designed to reveal that the fruit on top is not an accident, but that all are large and plump, bears little resemblance to the hard cores of the showy, thorny tea roses offered up in the plant section. By this point in the season, the strawberry blossoms have been transformed from the five white petals of spring to small, barely recognizable green button to a succulent, bright, very edible fruit. This is the strawberry, grown by countless millions in a very large industry, and for good reason. Most people find strawberries delicious.

Members of the *Fragaria* genus, the name comes from the Latin for fragrance ("fraga") and possession ("aria"), referring to the scent of the fruit. There are approximately 20 recognized species. *Fragaria* species are nearly worldwide in their distribution and have a long history of introduction to regions outside their native range. The garden strawberry is a hybrid of Virginia strawberry (*Fragaria virginiana*) and Chilean strawberry (*Fragaria chiloensis*), another widely distributed New World species, native to both South and North America. First cultivated in France during the 18th century, early experimentation with strawberry species have resulted in many cultivars, and worldwide production is measured in the millions of tons. The top three strawberry producers include the United States, Turkey, and Spain. And although growing strawberries commercially is a big agribusiness, organizations promoting the cultivation of these nutritious berries encourage the smaller grower by providing advice and support.

Native strawberry species are relatively common in North America, particularly in lower elevation



Virginia Strawberry - *Fragaria virginiana*
Parent of cultivated strawberries

habitats, and, as is evident in the photograph of the native Virginia strawberry, they resemble the commercially grown strawberries. The berries and flowers are smaller but unmistakable, and the leaves are a giveaway. The plants hug the ground and tend to spread wherever opportunity allows.

This strawberry is not confined to Virginia but rather is one of the most widely ranging strawberries, growing north to the Arctic Circle, and across the continent. The berry shown in the photograph is a subspecies (*platypetala*) native west of the Rockies, where it ranges from the lowlands to higher elevations of the western mountains.

A common strawberry with a circumboreal distribution, the Woodland Strawberry (*Fragaria vesca*) propagates with runners or seeds, and as its range indicates, is a very adaptable, growing in a variety of habitats, capable of withstanding fire. As the photos show, the bright blossoms have five white petals, and the berries are unmistakably strawberry-like, but quite tiny. They are very tasty if not particularly filling and readily consumed by mammals and birds.

THE BEAUTIFUL, EDIBLE ROSE

Nevertheless, the Woodland Strawberry has its own claim to fame. Introduced to the Middle East, archeological evidence indicates that it was grown for medicinal properties as well as food. Certainly strawberries were collected if not specifically grown by humans for thousands of years. By the 1300's the



Woodland Strawberry - *Fragaria vesca*

Woodland Strawberry was known to be cultivated in France when wild populations were transplanted from the wild to the garden. A couple of centuries later, the Woodland Strawberry was joined by the Musk Strawberry (*Fragaria moschata*) as a cultivated plant, but it was the introduction of the Virginia Strawberry and the Chilean Strawberry, the latter

carried to Europe from Chile, that would bring about the hybridization, selection, and cultivation that resulted in the "modern", large strawberry. The introduction of the Chilean Strawberry to Europe is a story of espionage and intrigue that involved none other than the powerful but threatened Louis XIV of France, apparently a strawberry-loving king who was much concerned about the possibility of a waning influence in South America. Louis sent an engineer named Amedee Francois Frezier, disguised as a merchant, to investigate the strength of Spain in the New World. Frezier was a writer and aman interested in a variety of subjects, including the life sciences, but perhaps not specifically horticulture. Yet it happened that Frezier's good luck was to come upon the Chilean strawberry, which was being grown in gardens of native peoples, a domestication that stretched back countless generations, much longer than strawberries had been cultivated in Europe.



Chilean Strawberry - *Fragaria chiloensis*

Frezier's real mission of ascertaining Spanish strength in South America was kept hidden as he ingratiated himself with Spanish officials. But in addition to writing about forts and military strength, he noted that local strawberries were large, nearly white in color, and much consumed locally. In 1714, his intelligence mission complete, Frezier returned home. In addition to his collection of notes about Spanish might, Frezier carried five live strawberry plants. Two went to the ship's superintendent of cargo, one to his superior in France, and one to the head of the Royal Gardens in Paris. He kept the fifth strawberry. Soon offspring of the Chilean strawberry (they clone asexually) were distributed throughout Europe. Unfortunately the five and offspring did not bear fruit. Undoubtedly female plants, they were incapable with most strawberries. The chromosome count was unusual--only the Virginia strawberry had the same octoploid chromosome count. What this meant was that the lovely plants were doomed to only on occasion produce a misshapen fruit. The male plants had not been purloined out of Chile along with the

THE BEAUTIFUL, EDIBLE ROSE

female. They, after all, had not produced fruit.

Time passed (fifty years or so), when Louis' descendent, Louis XV, was the beneficiary of productive Chilean strawberries that were large and beautiful. A young botanist named Antoine Nicolas Duchesne had managed to cross Musky Strawberry with the Chilean species. Unfortunately, the plants were sterile. So while the king may have been pleased with the offering, the young botanist remained stumped by the problem of producing viable strawberry seeds.

Yet it was Frezier who noticed that farmers had produced in the field what scientific minds in hindsight came to understand--viable, large, strawberries. The long-separated but closely related species - the Chilean and the Virginia--had been reunited, and the result was the ancestor of our modern strawberry. Duchesne did come to understand that the two species had indeed been successfully crossed in a practical approach of planting together what obviously produced excellent results. And the plants were self-fertile. Duchesne called the new child of ancient parents *Fragaria ananassa* - the pineapple strawberry.

Although Chilean Strawberry (also known as Beach Strawberry) is most well known from its introduction to Europe in 1714, it is distributed throughout North and South America, as well as Hawaii. The Chilean subspecies was most desirable for its large fruit, produced only on female plants; the other subspecies are perhaps less well-known.

Thus, three of the wild strawberries that have played a role in the rise of the cultivated strawberry, are native to North America. The fourth, Musk Strawberry, is native to Europe and is still cultivated in some regions; several cultivars have been developed. Apparently the appeal of this lesser known species is an excellent taste.

In North America alone, approximately 3 billion pounds of strawberries are grown each year, with over half produced in California. In pounds, strawberries exceed apples. The fruit can be cultivated in places other than the beneficent climate of California, including the Northeast where small farms produce a sizable amount for local consumption. Fresh strawberries are known for antioxidants, vitamin C and other minerals. All of this expansion began with the Woodland Strawberry, with its long history of cultivation, to the introduction of the equally small Virginia strawberry. It was the size of the Chilean strawberry that gave a boost to the cultivation of larger strawberries today, all of them descendents of the two native species.

RASPBERRIES

Raspberries differ from the strawberries in the form of the plants, in berry structure, and in taste, but they are members of the Rose Family nonetheless--in this case, the *Rubus* genus. And as with their relative, the raspberries we buy in the market today are the products of a long history of selection and cultivation.

With long canes, cultivated raspberries are tall deciduous shrubs. The canes are typically cut to the ground each year; the rootstalk remains, and new shoots appear late in the summer; these will flower and produce the



***Rubus parviflorus* - Thimbleberry**
Large flowers, attractive shrub, unique berries - distributed east and west of the Rocky Mountains

THE BEAUTIFUL, EDIBLE ROSE

following summer. In the home garden and the commercial as well, the floppy canes are tied to wires connected by stout posts, forcing them into an upright configuration where the fruit can ripen more quickly in the sunshine and is easily picked.

Most cultivated raspberries have been developed from two species, European raspberry (*Rubus idaeus*) and Black raspberry (*Rubus occidentalis*), the first native to Europe and northern Asia, and the second a North American species widely distributed from the east coast of the United States and Canada to the Great Plains.

Many native raspberries resemble the small forest strawberries, with spreading stems, small leaves, and in spring, white, five-petaled blossoms that brighten the dark forest floor from early to late spring. The leaves typically are toothy, and most are shrubby, although at least one, Trailing blackberry (*Rubus ursinus*) grows along the ground. This raspberry bears black berries that are amongst the most delectable of the native species. One of the most infamous (and widely picked) genus members is Himalayan Blackberry (*Rubus bifrons*), a highly invasive robust species that seems capable of popping up anywhere and is devilish difficult to remove.

Other natives, like their progeny, have long canes, sometimes covered with a white "bloom", as is the case of Whitebark raspberry (*Rubus leucodermis* - "leuco" refers to the white color), a stout native with large delicious

berries and stout canes often as long as a cultivar. Its thorns are impressive, and photographing this raspberry, reaching for its sweet fruit, or walking near its arching stems is an endeavor to be undertaken with some care. This species is closely related to Black raspberry.

Rubus (meaning "red") includes the "blackberries" as well and is a very large genus--as many as 700 species, if liberally counted--and worldwide in distribution. The genus is considered botanically difficult, with the designation of species in North America alone varying from a small number to more than 200.

Raspberries range across a broad spectrum of habitats. Some are adapted to the cold, with at least one growing in Labrador. Many are native to temperate, moist climates, while a few survive in dry, desert regions. Most are restricted to the west or eastern side of the continental divide, where they may be widely distributed, although there are a few exceptions. Others are very limited in their native range. Such is the case with Thorny dewberry (*Rubus aculifer*), a species found only in New Hampshire. A species of more desert-like conditions, Arizona Dewberry (*Rubus arizonensis*) grows as far south as northwestern Mexico.

Top producers of commercial raspberries include Russia, Poland, Serbia, the United States, and Mexico. Serbia in particular is well-suited for growing raspberries, and is an important source of frozen raspberries for the worldwide market. Since raspberries require a chilling period, those regions most successful in raspberry production provide cool winter conditions and warm summers. In Mexico, the berries are most widely grown in the state of Jalisco, a territory with diverse habitats and a wide altitudinal range. The economy of the state is complex, with agriculture most common in tropical and subtropical



Whitebark raspberry - *Rubus leucodermis*
A native shrub with delicious berries

THE BEAUTIFUL, EDIBLE ROSE



The visual appeal of raspberries

areas. Jalisco is perhaps more well-known for its tequila, a fermented drink derived from an agave cultivar, quite unrelated to roses. The town of Tequila, a World Heritage Site is considered the birthplace of the drink, and its use, or that of the related mescal, dates back several hundred years.

In North America, raspberry production is most concentrated in Pacific states of Washington, Oregon, and California. In terms of dollars and acreage, raspberries represent a small percentage of fruit poundage

and dollar value. They are difficult to store, and thus beyond the local market are most commonly processed into juice, or frozen for wider use. The largest export value for American raspberries is the Canadian market.

As with many berries, raspberries contain antioxidants, are antimicrobial, and fat-free; they are high in vitamin C and free of fat. Their perishable nature and relative scarcity, compared to other fruits, makes them expensive, and nearly a luxury for the consumer. Nutritious and tasty, easily stored in frozen form, production of this delicious fruit is slowly increasing.



***Prunus serotina* var. *serotina* - Black Cherry**

THE TALLEST ROSE

Possibly the tallest Rose Family member in North America, Black Cherry (*Prunus serotina*) may reach over 100 feet in height. Fast-growing, it is considered a pioneer species, achieving its best rate on sunny sites. The bark is dark, broken into flakes when mature, but smooth and banded when young. The flowers are small and borne in groups. The "cherries" are edible, small, considered important for wildlife.

THE BEAUTIFUL, EDIBLE ROSE



Prunus serotina var. *serotina* - Black Cherry
larger than an orchard tree

Unfortunately for livestock, the leaves are poisonous, and (according to Wikipedia) a leading cause of illness in cattle. The wilted leaves contain hydrogen cyanide, and the cherry pits are poisonous as well. Since the trees grow very well in grazed areas and have been planted as hedgerows, removal of all of them is

problematic.

Black Cherry is most widely distributed throughout the eastern United States and Midwestern states, although absent from the Great Plains. It crosses the Rockies in the Southwest, and is found from western Arizona, south through Mexico and into central America. There are three (or sometimes four) subspecies, and the tree has been widely planted in the past in Europe where it has in some places become naturalized and invasive.

Also known as Rum Cherry, obviously for its use in flavoring rum and other drinks, the tree and its parts were utilized by Native Americans for a variety of ailments, although the species finds little use in modern herbal applications. A tea made from the bark was prescribed for the easing of labor pains, sore throats and other ailments, and the bark is a mild sedative. As with the leaves, however, the bark contains poisonous compounds, but it is the development of this compound in autumn that indicates collection at this time, drying, and administration in small doses. Supposedly used for dysentery and digestive disorders, the bark combines that element of danger and beneficence not uncommon in the plant world.

The fruits are flavorful, especially when ripened in a sunny location, and although the seed is poisonous, it can be swallowed whole (if so desired) with no danger. The wood is excellent for furniture and is light and hard, easy to work with.

So, as with many plants, Black Cherry is a mixture of the good and the less desirable. But with its long pointed bright leaves, its prolific blossoms in spring, the smoothness of the young bark and the roughness of the old, sweet cherries for birds and humans alike, and above all, the beauty of a tree on a sometimes wasted landscape--in the end, the presence of a Black Cherry is something to be celebrated.

THE BEAUTIFUL, EDIBLE ROSE

SERVICBERRY - SURVIVAL IN THE COLD

Most often stout large shrubs, occasionally a small tree, Serviceberry species (*Amelanchier*) although sometimes a tree or occasionally a dwarfed form, are found throughout North America, north to the cold Arctic Circle and south to Florida. Native to every state except Hawaii and all of the Canadian provinces and territories, serviceberry also is found in Asia, Europe, and Africa. The Flora of North America lists 23 species on the continent, but this is another one of those genera that can keep botanists from reaching a consensus. Serviceberries are apparently variable in form, such as leaves, which can be large or small on the same plant, and form. Sometimes the same species can take on a treelike form, other times a low-flowering shrub. They also hybridize, adding to the difficulties. Serviceberries also have a variety of common names, such as shadbush and saskatoon. Cultivars are popular in gardens.

Flowering in early to mid-Spring serviceberry blossoms are often borne in masses, and with their brilliant white color can transform an otherwise dull dry landscape (serviceberries grow in desert-like conditions as well as in the midst of temperate forests, and like sunny locations very much) into a pied collage. The flowers have long narrow petals and the leaves are typically toothed.

Serviceberry fruits are edible and are readily consumed by birds, and, in the past, were an ingredient for the widely consumed pemmican. This staple, a precursor to food bars and processed quick-energy food, was particularly important in the winter when game was not easily obtained and plants dormant. Originating in North America, the word is derived from a Cree word meaning "fat" or "grease". Long utilized as a storable food stuff sometimes essential for survival, the most basic recipe consists of meat, rendered fat, and berries. In autumn the availability of serviceberries would have made them an easily obtained choice for the mixture. An important food in Native American diets, by the nineteenth century pemmican was adapted by fur



**Canada serviceberry - *Amelanchier canadensis*
tree-sized!**

THE BEAUTIFUL, EDIBLE ROSE

traders and would eventually become a basic food for Arctic explorers.

Pemmican was an important enough food that it is mentioned in Native American myths, and today recipes, including a vegetarian version (which seems a little odd) are readily available. An Internet search brings up enough to keep you busy. But the question of whether or not it is truly a survival food, or rather more than one, remains.

The issue is scurvy, the dreaded disease of sailors, explorers, and any people reduced to a limited diet. Scurvy could decimate a ship's crew and was a factor in the success or failure of many expeditions. It is a vitamin C deficiency disease, and although the cause and cure were recognized, with citrus juice was the easy preventative, the threat was always present on a limited diet, or sometimes one where the money was not spent for the preventative. Since pemmican was an important part of Native American diet, particularly in the Northeast, the question of whether it alone, given the claim that it is the ultimate "survival" food, could prevent scurvy, remained.

Not surprisingly, people have experimented to find out, implementing pemmican-only diets to test the hypothesis. The results are inconclusive, as in at least one case other health problems were present, and the individual did exhibit scurvy-like symptoms but not the telltale loose teeth. Others claim to have used



Downy serviceberry - *Amelanchier arborea*

it for years with no ill-effects; of course, why anyone would want to live on what was wisely treated by the Native Americans as a survival food, not necessarily the most desirable meal, is unclear. What is known is that fresh meat (pemmican meat is dried) does provide Vitamin C, and apparently enough is available in pemmican to make prevention possible if large amounts are consumed. Hence the infamous explorer Steffanson's claim that he lived on it with no other food with no side effects is perhaps credible. A lot of pemmican may be necessary.

It seems likely that people depending on a pemmican-only diet may have suffered symptoms by the time fresh meat was once again available. What is fortunate is that scurvy is easily treatable with addition of Vitamin C, and those afflicted could quickly be cured. And in at least one region pemmican became a trade item for the local peoples. Berries

may not always have been part of the making of pemmican, depending on their availability perhaps, but in this case large quantities of the stuff were brought to Hudson Bay outposts, where the efficacy of pemmican had become recognized. This pemmican was made with serviceberries, which made it more appealing.

Aside from its use in pemmican, serviceberry fruit could be eaten while fresh, or dried, and the leaves were used for tea. One midwestern tribe used them for a beverage, mixing parts of the shrub and its

THE BEAUTIFUL, EDIBLE ROSE



Western serviceberry - *Amelanchier alnifolia*
A berry widely used in pemmican

peoples and individuals in harsh, sometimes life-threatening situations in the heart of a great but not always beneficent continent. The acquired knowledge of these predecessors who could make good use of a readily available plant and recognize its benefits as they did so, are beginning to be appreciated, as technical studies and personal experience with gathering, cooking, and use, add to the folklore and intertwine history and present.

berries together. Dried cakes of the fruit were prepared by some tribes, and the plant was used for medicinal purposes.

Today, besides the interest in pemmican, reflected in the many recipes proffered up on the Internet, and the discussion of its efficacy, as in the past serviceberries have found their way into a variety of recipes (pies, jellies, and the like). Easily grown, they are an excellent choice for an attractive native shrub in the garden, requiring little care once established and free of disease. Their nutritional value is similar to blueberries (although the two belong to different families), with antioxidant properties amongst other beneficial compounds. Interest in the use of native species and cultivars has increased as the desirability of serviceberries as garden plants and nutritional food continues to be addressed.

Thus, in the past the widespread serviceberry contributed to the survival of

THE BEAUTIFUL, EDIBLE ROSE

HARVEST



Akane apple

The strawberries have ripened, the raspberries have been picked, and the service berries have been readily consumed by birds. Faded leaves linger on the rose bushes, and the last flowers begin to droop. It is September, a time when most rose family members are beginning to shut down, their leaves losing the attractive green of summer, and the growth of branches and twigs has slowed. A few buds might still blossom, but the cooling, short days are a certain harbinger. Quietly succumbing, the roses plants are completing their yearly cycle.

Meanwhile, as if in denial the sun will soon be absent longer than present, hundreds of communities across the continent prepare for celebration. As countless of their unknown predecessors have done over thousands of years, the people begin to acknowledge what is in so many ways the most important time of the year. In the past, agricultural societies honored the gods with offerings, for they knew that survival through the long months ahead depended on the gathering and preparation of the harvest. At the very least, there was little to be lost and perhaps much to be gained by placating the invisible.

It was harvest time, and today the agricultural legacy continues, and if the connection with the land, the farm, the growing of plants is an endeavor that occurs somewhere else for most people, being an urban society as we are, this is perhaps when it moves the closest. The harvest festivals are attended by the millions. They are good for tourism, for the community, and just plain fun. And, somewhere, hopefully not far away, on the ground, climbing the trellis, or hanging from the trees, the objects of this attention and celebration ripens. They are ready for harvest.

For form and color, pumpkins and squashes are excellent subjects in displays, making them important contributors to autumn harvest celebrations. Visions of jack-o-lanterns appeal to young and old, and enormous bluish and yellowish squash evoke murmurs of appreciation and awe. These monsters require big boxes, or sometimes are laid out, solitary on the ground. But close by are other barrels and boxes, filled with the most luscious of autumn's offerings, smaller than squashes but available to eat raw and anticipated by those with a taste for the fresh and crisp. The apples are coming down, the trees left bare for the return of spring, when the cycle begins again.

Throughout the summer the orchards with their thousands of neat rows of carefully pruned trees

THE BEAUTIFUL, EDIBLE ROSE

have remained somewhat in the background. In spring, the blossoms are the subject of other celebrations, but those blossoms fade and fall, leaving on the tree what is hopefully a developing fruit. The green leaves



Fiesta apple

are simple in shape, the trees not especially tall (intentionally so), and the bark and limbs not particularly remarkable. After the spring flush it is mostly row after row of somewhat vase-shaped, broad woody and leafy structures.

Of course, they have planted in such quantity for a reason, and it is not really aesthetics, but what is the foundation of a huge industry. Most of the bounty will not end up in boxes and barrels at roadside stands, but will be

shipped elsewhere. Much will be processed, the products lining grocery store shelves across the country, waiting for the consumer who might not ever encounter the place from whence they came. The climate may be conducive to the growth, and everyone in the industry hopes for a "good year", but harvest is an intense time, and growing fruit a complicated and demanding business.

The product of this effort begins in early summer with the cherries, perhaps the most vulnerable of the fruits. It ends in autumn with the apples and pears, the greatest of the harvest. And all of these delectable, marketable fruits are borne on trees that are roses. They are temperate climate trees, modified by cultivation over many generations, subject to continuing research and alterations, sometimes producing successful new varieties, but often not. They are nutritious, appealing, and available for scrutiny by the expert, the opinioned, but, often as not, the appreciative consumer. It is hard to resist a ripe, round red apple nestled amongst its companions in a big box.

