

# Black Nightshade

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 Tuesday, 24 March 2009  
 Last Updated Tuesday, 24 March 2009

The following is a chapter excerpted from my upcoming book *Nature's Garden: A Guide to Identifying Harvesting, and Preparing Edible Wild Plants*. (This book should be available in Autumn of 2009.)

Black nightshade berries are commonly but erroneously believed to be poisonous in Europe and some areas settled by Europeans, but there is no basis for this belief. They are widely eaten throughout the world by hundreds of millions of people. Furthermore, the greens are even more commonly eaten. Cooked as a potherb, they are among the most commonly eaten wild foods on Earth -- regular fare for perhaps a billion people.

## Black Nightshade

*Solanum nigrum*, *S. americanum*, *S. ptychanthum*,

*S. douglasii*, and other closely allied species

Solanaceae &ndash; Nightshade Family

The very word "nightshade" causes many foragers to shudder with apprehension. It seems that everybody has heard of "deadly nightshade" and written off the entire group as too scary to contend with. How lucky we are that our ancestors were more confident in their botanical skills &ndash; for the amazing nightshade family has given us many cultivated fruits and vegetables, including potatoes, tomatoes, eggplants, bell peppers, hot peppers, ground cherries, and tomatillos.

Black nightshade is a common weed found on all the inhabited continents. It has a long and well-established history as a food source for numerous cultures around the globe. In fact, it is among the most widely-used and well-documented wild foods in the world, rivaled in this respect only by a few other ubiquitous weeds such as lamb's quarters, amaranth, and stinging nettle. There are probably over a billion people for whom the black nightshade is a regular or occasional item of diet. Yet in the predominantly "white" parts of the world &ndash; Europe and North America &ndash; the *Solanum nigrum* complex is widely believed to be extremely poisonous. The contradiction is stark, confusing, and quite amazing.

"The leaves and tender shoots are boiled in the same way as spinach and are eaten in many parts of India . . . The berries, when ripe, are often eaten by children and are sometimes used for preparing pies and preserves." - Chopra, Badhwar, and Ghosh, 1965, p. 670.

"Every intelligent child shuns the fruit of this weed . . . the poisonous properties of which are undoubted. Children who have eaten the fruit have died soon after from its effects." - "W.W.," in *The Gardener's Chronicle of London*, March 21, 1909.

"Ripe berries . . . are frequently eaten raw as fruits, particularly in parts of Africa. They are also widely used in pies and preserves, and sometimes as a substitute for raisins in plum puddings, particularly in North America. They can also make a delightful jam." - Edmonds and Chweya, 1997, pp. 56-57.

“The berries are poisonous, and will produce torpor, insensibility, and death.”-Brown, 1867, p. 110 “I have eaten pounds of pies, preserves, and fruit sauces made of the ripe berries.”

-Gibbons and Tucker, 1979, p. 251

One can't help but wonder how such discrepancies can coexist. But before we look at this question in detail, let's introduce the plant.

**Description** Authorities today recognize a number of similar species that used to be lumped together under one name, *Solanum nigrum*. All of these are called “black nightshade,” and exhibit only minor differences. In North America, *S. ptychanthum* dominates in the East, and *S. americanum* dominates in the South. The Great Plains is home to *S. interius*, and *S. douglasii* is found in the Southwest. *S. nigrum* is native to the Old World, particularly Europe and the Mediterranean; it is rather rare in North America, where it has been introduced. In most older works, any of these species is called *S. nigrum*. Today, many authors speak of “the *Solanum nigrum* complex,” which refers to all of the dozens of black nightshade species around the world formerly called *S. nigrum*. It is usually impossible to tell from older sources if the plant under discussion would now be classified as *S. nigrum* or some other species. This account pertains to those members of the *S. nigrum* complex found in North America. I use the name *S. nigrum* when referring generally to the black nightshades of this complex. I also use the names originally given in the sources I cite, but readers should be aware of the unique ambiguity of this group.

Here I describe the black nightshade that abounds in my area, *S. ptychanthum*. This is an annual herb with relatively weak, unarmed, smooth, hairless stems that branch widely and freely. In form it resembles its close relative the potato. Large specimens stand 3-4 feet (90-120 cm) high and span 4 feet (120 cm) or more in width, usually with the lower branches resting directly on the ground. However, like most weedy annuals, this plant can be sexually mature at almost any size, sometimes fruiting when no more than 3 inches (8 cm) tall.

The leaves are alternate, dark green, soft, and rather thin, often riddled with bug holes like those of amaranth, which they somewhat resemble. Their shape is variable, ranging from ovate or lanceolate to diamond-shaped. The margins may be entire or have sparse, rounded teeth. The leaf surfaces are glabrous or sparsely hairy. Petioles are 1.2-2.5 inches (3-6 cm) long, usually with a faint wing.

The flowers appear as early as June and continue being produced into autumn; they are most prevalent in late summer. Hanging in small clusters from the leaf axils, the blossoms grow on pedicels that are often unequal in length. The inconspicuous 5-petaled flowers are whitish and about a half inch across. In form they resemble tomato flowers.

The fruit is almost perfectly spherical, about the size of a pea or a blueberry, green at first but turning black when ripe. They are subtended by a persistent 5-parted calyx that is little, if at all, wider than the fruit. The skins are somewhat tough, like tomato skins, and encapsulate a soft, juicy interior with numerous seeds.

There are a number of toxic nightshades which must be avoided. Among these is belladonna *Atropa belladonna*, which has been frequently confused with black nightshade (and also shares that common name). Differentiating this plant from black nightshade will be discussed at length later. Bittersweet nightshade *Solanum dulcamara*, while a member of the same genus as black nightshade, is very easy to tell apart. This species is a semi-woody vine with large, deeply lobed leaves. The striking purple flowers are borne in panicles of about a dozen, ripening later into oblong red berries. Bittersweet nightshade is a common weedy vine of semi-shaded localities and often grows on hedges, fences, and porches. The bright red fruits seem to attract children, but they are somewhat poisonous. Read the above description of black nightshade carefully, as there are a number of other nightshades with toxic fruit.

### Range and Habitat

Black nightshade is found just about anywhere in the world where there are weeds. It occupies gardens, yards, agricultural fields, construction sites, and other areas where humans disturb the soil. Natural habitats include river floodplains, steep banks, flooded areas, and storm-damaged woods. It typically persists at a site for only one to three years before being crowded out by perennials, unless the ground is disturbed repeatedly. The seeds can persist viably in the soil for years, waiting for the proper germinating conditions to present themselves. Unlike most weedy species, black

nightshade does not seem to do best in full sunlight, preferring a light to moderate shade.

### The Mystery of a Myth Are ripe black nightshade berries toxic?

Let's take a scientific approach to this question. Two hypotheses have been presented: 1) The ripe berries of black nightshade are edible. 2) The ripe berries of black nightshade are deadly poisonous. (Note that, through this discussion, I am referring to the ripe fruit unless otherwise specified.)

Hypothesis 1 is supported by the actions of hundreds of millions of people who have consumed the plant, plus the actions of untold ancestors who have handed the tradition down to them. The literature contains a wealth of information pertaining to the consumption of black nightshade berries. Schilling et al. (1992) report that the berries are eagerly sought and eaten by children in India. They are also eaten in China (Hu, 2005), the Philippines (Siemonsma et al. 1993), Nepal (Manandhar, 2002), Java (Duke, 1987), southern Europe (Couplan, 1998), South Africa (Quin, 1959), and Ethiopia (Guinand and Lemessa, 2001). They were eaten by the Mendocino Indians of California (Chestnut, 1902) as well as the Tubatulabal (Voegelin, 1938). In Turkey, the berries are traditionally used in sweets (Dogan, et al., 2004). Some recent wild food authors report their own consumption of these berries (Gibbons and Tucker, 1979; Nyerges, 1999).

Furthermore, black nightshade has been cultivated for over a hundred years in European and American gardens for its edible fruit, sold under the name of "garden huckleberry," "sunberry," or "wonderberry." The wonderberry, now known to be an African species of black nightshade *S. retroflexum* (Defelice, 2003; Heiser, 1969), and not the special new hybrid that plant breeder Luther Burbank once claimed, was described in a 1909 seed catalog as, "Like an enormous rich blueberry. Unsurpassed for eating . . . The greatest garden fruit ever introduced" (from Heiser, 1969, p.). Relatively recent authors in the US and England have recommended this fruit for pies and jam (Fisher, 1977; Simms, 1997). A quick internet search shows that these black nightshades are still available from some seed companies.

I can add my own experience to this list. I began eating wild black nightshade berries at the age of twelve and have avidly sought them since. I have eaten the berries on many hundreds of occasions — sometimes more than a cup at a time. I eat them because I find them delicious. After introducing my wife to them, she decided that we would encourage the volunteers in our garden. In my wild food workshops and in everyday life, I have fed the plant to a few hundred people, most of whom liked the fruit, and none of whom were harmed by it. I have met a few dozen people who, like me, make the berries regular fare when available. Most of them learned this from books or fellow foraging hobbyists, but a few reported that eating black nightshade berries was a family tradition. The same friend who taught me to eat this fruit started feeding them to his son at two years of age.

The conclusion that black nightshade berries are not toxic is supported by additional evidence. In one German study (Schreiber, 1958, from Bruneton, 1999), no alkaloids could be detected in 22 samples of ripe fruit of European *S. nigrum* (solanine, atropine, and other nightshade toxins are alkaloids). Cippolini and Levy (1997) state that *S. americanum* fruit has "negligible levels" of alkaloids. Voss et al. (1993) studied the toxicity of black nightshade berries (*S. ptychanthum*) in feeding experiments with rats. Even when fed a mixture of ripe and unripe berries as 25% of the diet for several weeks, no mortality was observed.

Since untold millions of people eat black nightshade berries, we should see cases of poisoning in the medical literature quite frequently if hypothesis 2 (that ripe black nightshade berries are extremely poisonous) is correct. It seems that there would be legal action against the seed companies that sell the plant, or the authors and publishers of the many books that extol its edibility. Contrarily, I can find no record of such a lawsuit, nor of any documented case of poisoning by ripe black nightshade berries in the last 50 years. The evidence points overwhelmingly to the conclusion that black nightshade berries are edible.

However, we are still left with explaining the origin of such a pervasive myth. Literature from the 1800's contains a few accounts of poisoning by ripe *S. nigrum* berries. These cases seem to be confined to Europe. Chopra et al. (1965) presume that, because the ripe berries are known to be edible, all such accounts refer to unripe berries. This conclusion at first appears sound, but closer examination renders it untenable, since some of the cases specify that ripe berries were the agent of poisoning. Many modern authors cite the fact that the unripe fruits are toxic as justification for the berries' reputation as deadly, and suggest that this means that the fruit should be avoided entirely. This is nonsense. Unripe mayapples are very toxic (Turner and Sczawinski, 1991) yet this plant's ripe fruit is not shrouded in horror. In fact, many common fruits are poisonous when unripe, and this doesn't seem to worry us at

all. While the unripe fruits should probably be avoided (although this, too, is disputed by some), and credible poisonings have been attributed to them (Chopra et al. 1965), this in no way justifies or explains the horror with which the plant is typically treated.

A significant observation is that, in the late 1800's, cases of reported poisoning from ripe black nightshade berries almost completely cease; to the best of my knowledge, the last documented case in the English language occurred in Ireland in 1952 (Towers, 1953). What happened? Certainly, the plant didn't transform from deadly to delicious over a few generations. And Europeans continue to be affected by other poisonous plants.

The discrepancy in the literature is commonly explained away by the proposition that individual plants vary widely in the toxicity of their berries. This makes no sense; it cannot account for the cessation of reported poisonings, nor can it explain why the poisonings are reported in a limited geographical area. If chemical variability of individual plants accounted for the differing reports of edibility, then we would see poisonings occurring most often where the berries are eaten most often. Instead, the converse is true; the reported poisonings are concentrated in Europe, where the berries are not regularly consumed.

It has also been argued that the toxicity varies on a larger scale, with some populations, species, or subspecies being deadly, while others are edible. Although highly unlikely (there is no known case of plants this closely related having fruit that varies by such extremes), this explanation is conceivable. But again, if this is true, why would the poisonings in Europe have ceased? Why would analysis of European berries show them nontoxic (Schreiber, 1958)? Why would Gerarde and Dioscorides, both Europeans, call them harmless (Defelice, 2003)? Why would Couplan (1998) claim that the ripe berries are eaten raw or cooked in parts of southern Europe? Where are the documented cases of poisoning?

Even in Europe, the toxicity of *S. nigrum* berries has always been disputed. The famous botanist Michel-Felix Dunal (1813) of Montpellier, France, ate the berries on several occasions and claimed them harmless. This made quite an impression on his contemporaries, and he was much quoted by incredulous 19th Century authors. Balfour (1873, p. 462) stated of *S. nigrum*, "It contains a small amount of solanine in the juice of the stem and berries, but it may be eaten as food, as in France." Francois Couplan, Europe's leading authority on edible wild plants, tells me that he eats these berries often and loves their addictive taste. He adds that, while people in Europe generally believe them poisonous, there is "no toxicity whatsoever" in the ripe fruit (pers. comm., 2009).

Fortunately, there is a perfectly good explanation for all of this. In Europe there is another plant sometimes known as black nightshade: *Atropa belladonna*, a well known poisonous plant that has been used for centuries in medicine and murder. The primary toxic (and medicinal) constituent of *Atropa belladonna* is atropine, which causes a whole suite of neurological and physiological effects. Common names for this plant include belladonna and deadly nightshade; unfortunately, due to its black berries, it is also occasionally called "black nightshade." The shared common name makes confusion likely, and the physical similarities of the plants only exacerbate the problem. Elizabeth Daly's 1963 novel *Deadly Nightshade*, the plot of which revolves around a case of poisoning by nightshade berries, demonstrates how false conclusions are an easy task for the lazy or uninformed. At one point, Daly's detective says, "Solanum nigrum Linnaeus. Also 'Black, Deadly, or Garden Nightshade. Also *Atropa belladonna*. That's the poison." (p. )

Daly's mistake has been made again and again; it inundates the older literature, and is still made with frightful regularity today. I am convinced that this confusion accounts for the reputation of ripe *S. nigrum* berries as toxic. I am not the first to conclude this; Dunal (1813) made exactly the same argument 200 years ago in France. Displaying the fear-mongering suspension of logic that often accompanies the discussion of black nightshade berries, one of Dunal's critics made a strident but worthless effort to discredit him by pointing out that the raw leaves have caused poisonings, stating that this "places beyond doubt the often contested toxic properties" of *S. nigrum* (Tardieu and Roussin, 1875, p. 925, translation mine). Of course, this has nothing to do with the berries. Interestingly, in French, *S. nigrum* and *Atropa belladonna* also share common names, and the idea that *S. nigrum* berries are extremely toxic is still deeply entrenched in France today. As in the English sources, older accounts of black nightshade poisonings in France are highly suspect, such as a case reported by Dufeillay (1838), in which the poisoned children described the berries as red.

The confusion between *Atropa belladonna* and *Solanum nigrum* is a problem that has long been recognized in the English-speaking countries as well. In a medical treatise on treating cases of poisoning, Murrell (1884, p. ) says that *S. nigrum* is often mistaken for belladonna, adding, "Medical witnesses and coroners often wrong on this point." In *A Manual of Toxicology*, John James Reese (1874, p. 450) states that,

“There is great discrepancy among authorities about the poisonous properties of the above two species of *Solanum* [*dulcamara* and *nigrum*]. . . . Some have supposed that the cases of poisoning that have been ascribed to the two species were, in reality, to be accredited to the Deadly Nightshade (*belladonna*), which had been mistaken for the others.”

The following anecdote shows that the confusion has gone both ways:

“*Solanum Nigrum* has often been mistaken for *Belladonna*. A physician in Ohio confidently said to me, that *Belladonna* grew plentifully in every part of his county, and upon my questioning the accuracy of his statement, he produced a very fine specimen of *Solanum Nigrum*, saying, “If that is not *Belladonna*, what is it?” - Hoyt, 1874, p. 374

Indeed, the poisoning symptoms described in the old accounts usually suggest atropine poisoning more than that of solanine. The fact that this myth originated in Europe, the primary natural range of *belladonna*, and has persisted most tenaciously there, lends further support to this conclusion. In contradistinction to the case with *S. nigrum*, the medical literature contains hundreds of cases of poisoning by *Atropa belladonna* berries. These cases are easily found, relatively consistent in their described symptoms, and many of them occur quite recently. When you consider that *S. nigrum* is a far more common and widespread plant, eaten regularly around the world, there should be millions of such cases if it were equally poisonous. This is perhaps an appropriate place to point out another obvious fact: myths of toxicity are commonplace (in fact, I’d argue that they are a universal feature of human culture) while myths of edibility are exceedingly rare, since they are soon discredited.

People have an amazing ability to make our observations coincide with a preconceived belief (see *Making It Fit*, p. ). In 1978, a red panda escaped from a zoo in Holland. Local newspapers informed the public, in hopes that the animal could be recaptured, but by this time, the panda had already been found dead near the zoo. Yet over a hundred sightings of the panda were reported, all of which occurred after the animal was dead (Feder, 1996). These people weren’t reporting the panda because they had seen it; they were seeing the panda because it had been reported. Similarly, it seems that reports of poisoning from black nightshade berries occurred because the plant was believed to be toxic, rather than the converse.

The black nightshade is not the only European plant to be subject to a toxicity myth of such stark contrast to reality. As surprising as it sounds, the parsnip *Pastinaca sativa*, the very same plant that is available in markets and grocery stores all across the northern hemisphere, which has been grown for thousands of years for its esculent roots, is widely reported in wildflower books to be deadly poisonous. This myth, like the black nightshade myth, probably arose as a way of keeping people from collecting the plant in the wild and confusing it with toxic relatives.

By the late 1800’s, at least in the US, some authorities began to cautiously challenge the myth. Behr (1889, p. 201) says, “It is not poisonous in California, at least under ordinary circumstances. The same species is

*Atropa belladonna*(*belladonna*) Fruit borne singly in leaf axils Conspicuous, shiny, cherry-sized fruit 5-pointed calyx more than twice as wide as berry Flowers bell-like, 1 inch (2.5 cm) long, purple or purple-brown Leaves rarely bug-eaten, margins entire Upright form, usually taller than wide Rare in North America, confined largely to the coasts

*Solanum nigrum* complex (black nightshade) Fruit borne in axillary clusters Pea-sized fruit, dull, inconspicuous 5-pointed calyx, about as wide as berry, or less Flowers white or off-white, 5 petal-like spreading lobes, 0.4 inch (1 cm) wide. Leaves usually bug-eaten; margins may be entire, sinuate, or dentate. Spreading form, usually wider than tall Common weed throughout North America

common in Europe, where it is considered poisonous. In 1905, Botany professor Charles Bessey wrote a letter to American Botanist regarding this inversion of thought:

"[This] reminds me of an incident which occurred in my class in Botany nearly thirty five years ago. I was lecturing on the properties of the plants constituting the Solanaceae, and, as a matter of course, said that the berries of the black nightshade (*Solanum nigrum*) were poisonous. A young fellow from Fort Dodge, Iowa, spoke up and said that the people in his neighborhood made them into pies, preserves, etc. and ate freely of them. I answered him, as became a professor of botany, by saying that as it was well known that black nightshade berries are poisonous, the student must have been mistaken. . . . After a while, however, I learned that the people in central and western Iowa actually did eat black nightshade berries, and they were not poisoned either. Later, I learned the same thing in Nebraska for this species."

Since then, the obvious fact that black nightshade berries are not deadly poisonous has been slowly and reluctantly accepted. This is often expressed with guarded language and reservation, but at other times it is stated plainly that the berries are edible and delicious. Most scholarly works since about 1960 agree that the ripe berries of the *S. nigrum* group are edible or at least nontoxic. European authors seem to have more reservations; in France, Bruneton (1999, p. 485) ventures only that "The reputation of the plant seems exaggerated." And of course, misinformation remains common. Here's what I found in my two unabridged dictionaries:

Black nightshade, a weed with white flowers, poisonous black berries, and leaves that have poisonous juice (World Book, 1971, p. 212). Black nightshade, a common weed, *Solanum nigrum*, having white flowers and black edible berries (Random House, 1966, p. 154).

Interestingly, despite the fact that enormous numbers of ethnographic sources describe the berries being used as food, and despite the fact that legions of people willingly, gladly, and repeatedly eat them, the wild food literature has become one of the loudest voices contributing to the fear that surrounds this plant. Peterson's field guide (1977) lists it as "poisonous," accompanied by a skull and crossbones. Elias and Dykeman (1982) lump it with other nightshades as poisonous. Henderson (2000, p. 189) nebulously suggests an unspecified danger: "Although

some nightshades actually bear edible fruit, none of them are worth the risk.&rdquo; Tull (1987, p. 186) says, &ldquo; I consider the whole plant potentially deadly and leave it alone.&rdquo; (Here she misleadingly cites Heiser [1969], but in that source Heiser tells us that he made and ate a black nightshade pie!) Many other wild food books take the very reasonable position of not discussing the matter. However, I am proud to align myself with the significant minority of authors (Gibbons and Tucker, 1979; Nyerges, 1999; Couplan, 1998; Van Wyk, 2005) who unabashedly proclaim the ripe fruit edible.

Still, I wondered if, very rarely, ripe black nightshade berries contain an abnormally and dangerously high concentration of solanine. It seems possible. Put into perspective, this fact shouldn't even be particularly alarming; virtually all edible plants contain toxic compounds. There are numerous documented poisonings from potatoes *Solanum tuberosum*, several of which have resulted in death (McMillan and Thompson, 1979; Bruneton, 1999; Hanson, 1925). Curly dock *Rumex crispus* remains a popular wild edible, despite the fact that, rather recently, a man apparently overindulged on the leaves and killed himself (Xirgu et al., 1989). Does this happen with black nightshade?

With this question in mind, I sought the last reported case of poisoning (non-lethal, incidentally) by ripe black nightshade berries, which occurred in Ireland and was recorded in an article entitled, &ldquo;A Case of Poisoning by *Solanum nigrum*,&rdquo; (Towers, 1953). Here, again, appears to be a case of mistaken identity. Throughout the article, there is conclusive evidence that the plant that was actually responsible for this poisoning was *Atropa belladonna*. The victim's description of the plant and its berries strongly suggests belladonna, and is scarcely compatible with the characteristics of *S. nigrum*. The symptoms described clearly fit those associated with atropine (the primary toxin in belladonna) rather than solanine (the toxin found in unripe black nightshade berries). I was prepared to carefully advance this argument, but fortunately our good Dr. Towers does this himself &ndash; unwittingly testifying convincingly against his own conclusions. He attests (p. 79), &ldquo;Having thus reviewed the pharmacology of atropine, it is possible to see that this case under discussion shows most of the classical features associated with the drug.&rdquo; However, atropine is not found in *S. nigrum*; it is commercially extracted from *Atropa belladonna*, from which its name is derived. Towers apparently was unaware of this; he clearly writes under the assumption that what is true of one of these nightshade is also applicable to the other. The prevalence of this irresponsible attitude makes careless investigation of this plant no surprise. Indeed, the two-page commentary following the clinical notes mentions *S. nigrum* only once, in the first sentence. Amazingly, thereafter, the text refers only to belladonna and atropine. Towers concludes (p. 80) by stating that the victim's symptoms &ldquo;fit in with the classical features of poisoning by atropine caused by eating berries of the deadly nightshade type.&rdquo; The name &ldquo;deadly nightshade&rdquo; is most properly applied to belladonna, not *S. nigrum* (although it is often mistakenly applied), and of the two species, only belladonna contains atropine. By this point, his article has quietly transformed into &ldquo;a case of poisoning by *Atropa belladonna*.&rdquo;

Through an extensive search of literary sources and consultation with experts, I have been unable to locate a single credible, documented case of poisoning from the ripe berries of any member of the *S. nigrum* complex.

### Black Nightshade Greens

As well documented as black nightshade berries are as a food source, the greens are even better documented. In fact, they are among the most commonly eaten wild green in the world. Black nightshade greens are regularly consumed by the poorer classes in virtually every tropical and subtropical country on Earth, as well as occasionally in the temperate zones. Again, European and North American literature often calls these greens poisonous or deadly, but authors from the tropics hold a completely different attitude. Consider this:

&ldquo;The tender shoots, young leaves and unripe green fruits are eaten as a vegetable, raw, cooked or steamed (for 5-10 minutes), alone or in combination with other vegetables. . . . *S. americanum* is used as a green vegetable throughout South-East Asia and the green fruits can be bought in the local markets. It is common in the vegetable assortment of large supermarkets. . . . Being a common crop of home gardens and a common weed of cultivation, its importance is considerable.&rdquo;-Siemonsma and Pilvek, 1993, p. 253

These authors conclude their account by suggesting that black nightshade should receive more research attention as a food crop. Nowhere in their rather lengthy treatment of this plant do they even mention any concern over toxicity. And note their repeated mentioning of the green fruits as food. (Be aware, however, that analyses have clearly shown the green fruit of at least some species to contain high levels of solanine. I cannot recommend eating them.)

Chopra et al. (1965, p. 670) tell us that "The leaves and tender shoots are boiled in the same way as spinach and are eaten in many parts of India." The young greens are eaten in Vietnam (Tanaka and Ke, 2007), Nepal (Manandhar, 2002), and China (Hu, 2005). Couplan (1998) says that black nightshade greens are the most popular vegetable in Madagascar; he says (pers. comm., 2009) that they are eaten at "almost every meal." In three villages in Tanzania, Fleuret (1979) found black nightshade to be the second most commonly eaten wild green — only amaranth was eaten more. The greens were also sold in local markets. Purselove (1968, p. 65) says that *S. nigrum* "is extensively used as a pot-herb in Africa and Asia, in spite of the fact that it is reputed to be poisonous in Europe." Heiser (1969) found the greens regularly for sale in vegetable markets in Guatemala. Edmonds and Chweya (1997, p. 56) summarize, "Leaves and tender shoots are widely used as vegetables throughout the world . . . All the species [of black nightshade] are used as pot-herbs or leaf/stem vegetables more or less throughout their respective ranges in Africa, Asia, Malesia and the Americas." Black nightshade green are eaten so frequently and widely that documenting it in this way feels almost as superfluous as documenting the edibility of onions.

Looking to uphold the Western notion that this plant is deadly poisonous, some suggest that the edibility of tropical forms differs from ours. There is nothing to support this idea. The most widespread black nightshade of the Old and New World tropics is *S. americanum* (Edmonds and Chweya, 1997), but this species is also widespread in the US. Black nightshade was said to be "the most relished potherb" of the Cherokee (Witthoft, 1947). Couplan (1998) reports it being eaten in southern Europe. In Wisconsin, Minnesota, and surely elsewhere in the US, black nightshade greens are actively sought and commonly eaten by Hmong immigrants.

But some Americans desperately want us to be terrified of this plant. Based on her interpretation of one anecdotal account, Fackelmann (1993) conjectures that people who eat black nightshade greens must first undergo a lengthy process of building up a tolerance to the solanine — otherwise they will be poisoned. Although she provides no scientific evidence to support this claim, many people have accepted it as fact. If this were true, however, it seems that all who travel to the tropics would be warned "Don't eat the greens!" and deaths of tourists would regularly occur. Fackelmann makes it sound as if only a few obscure, impoverished cultures eat this vegetable, when in fact it is a common food for hundreds of millions of people in dozens of countries. Although there may be some merit to her hypothesis — lifelong eaters of nightshade greens probably do build up some tolerance to the solanine they contain — the tone of the article still feels fearful, condescending, and ethnocentric.

I know of at least a few Americans, including myself, who have eaten these greens without building up a tolerance, and none of us were poisoned.

This doesn't mean that black nightshade greens are nontoxic; they definitely contain solanine. Most ethnographic sources report the greens being boiled and drained, often repeatedly, to reduce the solanine content to acceptable levels. It is also often reported that children do not like this vegetable due to its bitter flavor. Some users report that if eaten too often it will cause stomachache (Guinand and Lemessa, 2001). Anyone who chooses to try black nightshade greens should consider this and proceed with caution.

## Harvest and Preparation

**Berries:** Black nightshade berries are delicious, abundant, widespread, and easy to harvest. Only eat the ripe berries, which turn juicy and dark purple-black. (A few species, such as *S. villosum*, have berries that ripen to yellow or orange, but these are not commonly found in North America.) Do not eat partially ripe berries that still contain green lines, and do not eat ripe berries if they taste bitter or unpleasant to you. As always, eat small portions your first few times.

Don't imagine that black nightshade berries are a substitute for blueberries or any other familiar fruit. Their flavor is most like that of ground-cherries (genus *Physalis*) — like fruity tomatoes. Generally, I eat the berries raw. Whenever I happen upon a plant bearing ripe fruit, I eat as many as time or the supply allows. They are excellent in salad — although being perfectly round they tend to roll off your fork, and they're usually too small to spear with a tine. Alas, the conundrums of a forager. I also like them in tacos or burritos, where they aren't so mobile. They are good in certain soups or pasta dishes.

Black nightshade berries are also used to make uniquely delicious fruit sauces and jams. They remind me of ground-cherries, blueberries, and tomatoes, but their tiny seeds are slightly hot, especially when cooked. (To get in the right mood for this chapter, I savored some nightshade jam from our refrigerator.) The flavor and texture can be altered by straining out the skins and seeds. Although they are often reported as good for pies, I have never done this. I have also read that they are used in small quantities to add color to applesauce.

Black nightshade berries begin ripening in mid summer and continue late into the fall, often past light frosts. It is not uncommon to find flowers, unripe fruit, and ripe fruit on the plant at the same time. I have no special tricks for picking them, which I typically do while sitting comfortably beside a prolific plant. The branches droop and the fruit is often borne

near the ground; in this case, wash the berries carefully. From the best plants you might get over a quart of fruit, but it will go as slowly as picking blueberries.

I was once exploring an acquaintance's garden with him. When I found a black nightshade plant loaded with fruit and began eating them, he said, "Nightshade? My grandmother used to make nightshade sauce when I was little, but I never knew what nightshade she used." He tasted a handful, smiled at the flavor, then confirmed, "Oh yeah, this was definitely it." We talked a little of the sweet nightshade sauce that his grandmother in South Dakota made, which the family relished on pancakes and ice cream. He remembered this sauce fondly, saying that as a child he "wanted all he could get."

**Greens:** Although the tender leaves and young shoots are the most commonly eaten part of black nightshade worldwide, they do contain the toxin solanine. Solanine is also found in tomatoes, potatoes, eggplants, bell peppers, and even cherries, but it is more concentrated in black nightshade greens. Solanine poisoning can and has resulted from consumption of large quantities of some of these plants. If you choose to collect black nightshade greens, follow these guidelines to avoid ingesting excessive solanine: 1) harvest only the young, tender growth, as these parts contain less solanine. 2) Boil them in a full pot of water for 10-15 minutes, drain the water, and repeat this process. 3) Eat only small portions, especially at first. 4) Do not eat them if you find the bitterness extremely strong or distasteful. As with the ripe berries, I have been unable to find any documented cases of poisoning from eating the properly cooked greens.

Black nightshade greens have a well deserved reputation of being bitter. Few people like them unless they have grown accustomed to them. Personally, I have only eaten black nightshade greens a few times, as I find their bitterness unpleasant. However, their texture is like that of other superb annual greens such as lamb's quarters and amaranth.

Some people find it strange that a bitter green which is mildly to moderately toxic when raw would be so incredibly popular. It has been suggested that these greens are eaten only because of their anti-parasite properties. This may be a secondary benefit, but most people who eat them clearly do so because they like them. Black nightshade greens are also extremely nutritious, providing a much appreciated rich source of proteins, amino acids, minerals, and vitamins (Edmonds and Chweya, 1997).

In many respects, *S. nigrum* greens are much like those of marsh marigold *Caltha palustris*. Marsh marigold greens are toxic when raw, typically need to be boiled and drained to render them safe, still remain quite bitter when properly prepared, and are avoided as poisonous in some parts of the world — yet they remain one of the most popular wild greens over much of North America. Perhaps our Western conceit is unjustified after all.

Some who remain afraid to try this plant act as if those of us who eat it are foolish — and as if those who teach that it can be eaten are irresponsible. Meanwhile, millions of us chuckle and eat it anyway. I counter that it is irresponsible, and a bit ethnocentric, to insist on the veracity of this myth in the absence of any supporting evidence. After all, both the tomato and potato were once considered poisonous in Europe.