



HarperCollins e-books



Identifying & Harvesting
Edible and Medicinal

Steve Brill
Evelyn Dean



IDENTIFYING

and
HARVESTING



EDIBLE

and
MEDICINAL PLANTS



IN WILD
(and Not So Wild)
PLACES



“Wildman” STEVE BRILL
WITH
EVELYN DEAN

 HarperCollins e-books

This book is dedicated to the memory of David Drazen, my nephew, who passed away at the age of seventeen in 1989 after a heroic five-year struggle with leukemia. Dave actively participated in his treatment since the age of twelve. Instead of complaining, he made the most out of every minute of his life, despite years of suffering, even as his chances of survival dwindled to nothing.

If he could make so much out of so little, we can certainly work to achieve our potential as individuals, act as positive influences in the lives we touch, and contribute in some way to preserving or restoring the integrity of the environment, no matter what lesser problems we must deal with.

It was an honor for me to be part of Dave's life, and he will always be an inspiration to me.



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Chapter 1:

An Introduction to Foraging for Wild Plants

There are hundreds of fascinating, delicious wild vegetables, fruits, nuts and seeds, and herbs growing in our neighborhoods, backyards, parks, and forests that we overlook and disregard. Many are easy-to-recognize renewable resources you can easily collect and enjoy, with no harm to the environment. Many are the same prolific “weeds” we unsuccessfully try to destroy. When you know what they are and begin to use them, you’ll discover that they are tastier, as well as more nutritious, than anything you can buy, and they’re completely free.

This book will introduce you to the world of foraging and nature. We cover the most common useful wild plants of the continental United States (with the exception of subtropical Florida, which has a different, specialized flora) and southern Canada, with the basics of what you need to know to identify, collect, use, and appreciate them. My years as a naturalist draw on pertinent science, nutrition, folklore, and personal experiences to put the plants in context.

Since our focus is on the best, as well as the most practical, common, and widespread wild edible plants, many species you may find in other field guides are omitted. Wildflower, tree, and mushroom field guides in the Bibliography will help you identify a wide range of nonedible and marginally useful species. This book covers the choice edible species in full detail.

Many marginally edible plants just aren’t worth your effort: I’ve waded through frigid, muddy ponds to collect the tender young unfolding leaves of water lilies (*Nymphaea* species). After washing off the mud, cooking them, and serving them for dinner, I discovered that the “vegetable” tastes just like the mud it grows in. Later on, I found that some of my field-wild participants, inspired by other sources, had similar experiences.

I once dried the leaves of skunk cabbage (*Symplocarpus foetidus*) in my food dehydrator for a week, again following recommendations elsewhere, then added them to a pot of chili. Chili should be hot, but this brew was something else. After I tasted one spoonful, the calcium oxalate crystals that should have been dissipated by drying began piercing my tongue, like thousands of microscopic needles. After half an hour of drinking and spitting out water, jumping up and down, and cursing the author, I flushed the entire concoction down the toilet. Subsequently, a friend rendered this plant harmless by drying it for six months, but then it tasted like paper. This plant, and edibles that require hours of preparation for a few bites, are

omitted.

I've been using many plants for food and home remedies since the late 1970s, and I'd like to share my favorites with you. However, it's beyond the scope of this book to cover the thousands of purely medicinal, nonedible plants that also grow in our midst. We concentrate only on the delicious wild foods you can sink your teeth into. Also, we don't cover mushrooms, because you'd need a whole book to do them justice. Fortunately, there are many wonderful mushroom books on the market.

Most works on edible wild plants include recipes in which healthful wild plants are adulterated with refined and processed foods containing artificial chemicals. It's easy to make fantastic-tasting, nutritious meals without any of these. A large portion of this book is devoted to recipes and the ideas behind them, so you'll learn to create all-natural wild meals yourself.

This book includes many detailed pencil drawings that clarify the plants' identifying characteristics, and all their parts, as they appear throughout the seasons. Beginners seek out color photos, but these have disadvantages: Because leaves are green and flower colors can be described, color mainly raises a book's price. This limits you to one view per plant, usually when it's in flower, even when different stages are edible. Photos also contain extraneous details absent in good illustrations. You'll learn more from the greater number of excellent pencil illustrations we provide.

PREPARING TO FORAGE: CONSERVATION AND SAFETY



Poisonous plants, some of which are deadly, sometimes grow alongside edible plants, so you must identify every plant with 100 percent certainty before you eat it. There is no other foolproof method to determine whether something is edible. Look up *all* of a plant's identifying characteristics, and make sure they match *all* your observations. Then, check the accompanying descriptions of any possible look-alikes (especially toxic species), to make sure their key identifying characteristics *don't* match.

Cross-check any reference books you use, especially regarding medicinal plants. Other sources may simply repeat folklore from earlier books, without regard for accuracy or safety. When you look up a plant in more than one book, make sure it has the same scientific name, or you may poison yourself with sloppy semantics. Edible and poisonous plants sometimes have the same common name, and names vary from region to region and country to country. Scientific names are universal, and longer-lasting.

Start by learning a few easy-to-identify plants well. There are some people who've accompanied me on my well-attended nature tours in and around New York City who want to learn the whole country's flora in one afternoon. I am forced to announce that learning about too many plants at once causes not only confusion but permanent brain damage. The malady is called Dementia Botanica, and its first symptom is total destruction of good judgment. Victims laugh at my jokes.

Don't work with plants that have poisonous parts, or become poisonous when they mature until you have years of experience with safer plants. There are plenty of completely safe species to start off with. Wild foods and instant gratification don't always mix. You must sometimes follow a plant through an entire year before you know it well enough to eat. Many plants are the easiest to identify in seasons when they're not edible. If you return to the same location throughout the year, you'll come to recognize them at their edible stages.

Learn the common poisonous plants in your region, especially those that resemble edible ones. It will make foraging safer, and it will provide a last resort if the in-laws get out of hand.

Get permission to forage on private property. In New York City, I'd occasionally snatch a few handfuls of chickweed from someone's lawn with no problem. But when I was in New Orleans and was tempted to examine a plant in an overgrown area on posted property, my local friend told me never, ever to do that there. In some regions, people literally do show up first and ask questions later.

Find out if your foraging grounds have been sprayed before you pick. Many parks prohibit spraying, but some of the best plants grow in the partially shaded, disturbed habitats alongside railroad tracks. However, railroads often spray their right-of-way with very dangerous herbicides.

Wash your plants thoroughly under running water before eating them. Any undesirable natural deposits on their surfaces, such as traces of animal droppings, will wash away. (Nobody in their right mind would pick anything with visible animal droppings.)

Never collect rare or legally protected plants. There aren't usually enough of them to be worth eating anyway, and we want to encourage environmental recovery. Don't even pick common plants where they're rare. You'll collect them more rapidly where they're common, and they'll probably be of superior quality where they're thriving. Collect only the parts of the plants you're going to use. Don't uproot plants when you're going to use only the leaves. This is a common error small children make. You can gently explain the correct procedure.

Use common sense to assure that you don't harm the plants you're collecting. If you trample down bramble bushes to get every last berry, you're destroying future crops. Leave more than enough mature plants to reproduce and ensure that you have a future supply. Take only what you're going to use, and collect no more than 10 percent of any plant—less if you're sharing the foraging ground with other people. If you're collecting roots, be especially careful to collect only a tiny fraction of the most common root vegetables, since you're destroying them.

Don't collect near heavy traffic. Lead, the worst pollutant in exhaust fumes, usually settles within fifty feet of the road. Leave a much wider margin just in case. Most gasoline today is unleaded, but the soil may be contaminated from earlier times.

Leaves, roots, and stems contain the most lead. Fruits, berries, and nuts accumulate the least. Some plants, like wild onions, have a greater affinity for accumulating heavy metals than others. Environmental geologists are just beginning to experiment with such plants to remove contamination from soil.

Faster-growing species tend to pick up less heavy metal than more slowly growing ones. A

a jazz aficionado, I have no affinity for heavy metal. But if you find a tempting plant growing in a contaminated area, chances are that with some persistence, you'll also eventually find it in a cleaner location. Most wild foods are called "weeds" because they're so widespread and prolific. You just may not be spotting them yet.

Collect the right part of the plant in the appropriate season. Be careful not to collect parts of poisonous plants along with your edibles. A foreign family who knew barely any English attended many of my New York City park tours. Once I pointed out a nonpoisonous, flavorless mushroom, then moved on to lady's thumb. The family insisted on picking the mushrooms. I don't know whether they were being stubborn, or they didn't understand me. Everyone else was standing in the hot sun, waiting for me to discuss lady's thumb. I blew my whistle, signaled with my arms, and even turned red in the face, but they wouldn't come over to where the rest of the group was. I finally gave up and went over the new species, cautioning everyone about the poisonous dogbane growing alongside. Suddenly, a few minutes later, while everyone was happily collecting lady's thumb, I noticed half a dogbane plant, oozing toxic white sap. Where was the other half? I inspected the family's bag first (they had finally joined us), and sure enough, there it was.

Never collect water plants such as watercress without having the water tested, especially if you're going to eat it raw. There are dangerous microorganisms that can infect you, as well as other forms of pollution that can contaminate the water. Your local Environmental Protection Agency branch will test your water for pathogenic microorganisms free of charge.

It's much easier to avoid putting debris into your bag than to sort out trash later on. Put a little nonedible material in your bags as possible. This saves immeasurable time at home.

Put each species in a separate bag. Enclose an index card or label in each bag, with the name of the plant and any notes, especially if you're attending a field walk where the instructor identifies many plants. Seal wild vegetables in plastic bags to keep them from wilting.

If you do bring poisonous plants home for study, be sure they're clearly labeled. Take further precautions if necessary. Other family members may assume anything in the refrigerator is fair game for snacking, and small children may eat anything they can get into their mouths.

Wash all edibles in luke-cool running water just before you use them, but don't store them wet, or they'll spoil more quickly (microorganisms thrive in damp settings). If you think a wild plant or a wild-food dish has gone bad, throw it out. Don't risk food poisoning.

EQUIPMENT



It makes a big difference if you're properly equipped when you depart for your local wild areas. You'll need sealable plastic for your vegetables, and plastic containers for delicate berries. Be sure to bring plenty of water, especially if it's hot, and don't forget your lunch or a snack.

In very warm weather, bring snacks that don't spoil quickly, like nuts or fruit. When it's hot, it helps to sip ice water. Fill a water container three-quarters full the night before, and freeze it. Wrap it in aluminum foil and put it in a heavy sock, then fill to the top just before you leave. You'll have cold water for hours, and this funny-looking device is lighter and less bulky than a thermos bottle. A broad-brimmed hat is very helpful in the heat. Sun shining on your head and face makes you much hotter.

In cold weather, bring a wool cap, even if you think you won't need it. Thirty percent of lost body heat escapes from your uncovered head. Before you go out, always listen to the weather forecast, but don't believe a word of it. Dress in layers and bring an extra sweater just in case.

It's best to wear long pants and long sleeves unless it's unbearably hot, for great protection against thorns, poison ivy, and insects. In mosquito season, I spray my clothing with insect repellent containing the chemical D.E.E.T. These insects have had a special affinity for me ever since I was a child. They loved me when I ate junk food, and they adored me when I became health-conscious. They appreciated the extra nutrition when I took vitamin B₁ to repel them, and they feasted on herbal-flavored "Wildman" when I used garlic, citronella, pennyroyal, or other herbal repellents. The latest device I tried was an ultrasonic buzzer insect repellent. The mosquitoes buzzed back, and this increased their appetite. It's only the female mosquitoes that bite. They use your blood to nourish their eggs. If female humans loved me as much as female mosquitoes, I'd live a very short life.

Colors do affect insects. Beekeepers wear white, which bees usually avoid, and wearing white makes ticks show up on your clothing. Beige and green don't attract insects, but blue, red, and black do. When I once put my black backpack on the ground in a mosquito-infested marsh, many mosquitoes landed on the backpack because of its color alone. Never wear a fluffy wool sweater as your outer layer. An entangled bee could easily sting you.

If you live in tick country, wear light-colored clothing and a hat. If you have long hair, tie it. Tuck your pants into your socks, and avoid brushing against vegetation. When you get home, put your clothes in the laundry, shower, wash your hair, and inspect yourself in the mirror.

Ticks may be around most of the foraging season. The deer tick, which carries Lyme disease, is the size of the head of a pin. The dog tick, which rarely carries Rocky Mountain spotted fever, is much larger. Both have eight legs. They're not insects, which have six legs, but arachnids, relatives of spiders.

Ticks usually don't bite right away, so you have time to find them. Use petroleum jelly and tweezers to remove them. If you are bitten by a deer tick, and your skin looks like a target with a bull's-eye in the center, seek medical attention. However, this rash isn't always present, and the tick is so small, people sometimes don't realize they've been bitten. Antibiotics cure Lyme disease in its early stages; herbs don't. If you wait until you develop arthritis and other symptoms, it's much more difficult to treat.

Don't let ticks scare you into becoming a couch potato. Thanks to following the precautions above, I've never been bitten, with only one close call. After a day in the brush, I attended the dulllest lecture ever. The speaker carefully avoided using any public-speaking methods.

that spark excitement, and he said nothing interesting.

As I was sitting there scratching a tiny bump on my head, wondering why I was there, realized I had no bump on my head. It was a dog tick attached to my scalp poised to follow the example of the speaker and begin boring. The small room was well lighted, and I felt very conspicuous trying to dislodge the tiny parasite. Oblivious to my plight, the speaker droned on: “Blah, blah, blah! Blah, blah, blah!”

At last I yanked out the parasite and flicked it away. It tumbled through the air. The speaker, paying no heed, continued: “Blah, blah, blah! Blah, blah, blah!” But the tick landed in my boot. After several embarrassing minutes of useless squirming, trying to reach in and remove it, accompanied by the speaker’s drone, I excused myself, went to the men’s room, took off the boot, and flushed the tick down the toilet. I never returned to the lecture, but went home.

Sneakers are the best footwear for most outdoor situations. Hiking boots tend to be heavy and weigh you down, and most expensive waterproof brands leak. Waterproof Gore-Tex rain pants and jackets, albeit expensive, are good for hot, rainy weather because they let your skin breathe. For a cheap, if unstylish waterproof poncho, cut holes for your head and arms, and put it in a heavy-duty Hefty garbage bag.

An inexpensive whistle is good for communication. One whistle lets your friends know where you are. Two whistles means come over, I’ve found something. Three whistles is for SOS. This system is not infallible. When an aspiring botanist became separated from my group in the woods, she kept walking toward the sound of the whistle but never quite caught up. She finally located the source, emerging on a field of soccer players.

A magnifying lens of 15 to 20 power is very useful for identifying plants. Some important features are too small to see with the naked eye. Edible milkweed and poisonous dogbane shoots look very similar, but milkweed’s stem has tiny hairs, visible under magnification. Dogbane’s stem is bald. Some of the most beautiful features of small flowers and other plant parts are also revealed under magnification.

People often make the mistake of getting Sherlock Holmes-type reading lenses. They’re usually only 5 power—not much help. Jeweler’s loupes, consisting of two back-to-back lenses, are best. The small field size is fine, since we’re looking at tiny plant parts. A large stationery or camera store can provide one at half the price of one purchased from a jeweler’s store. Tie a string to the loupe and loop it around your neck.

[WILD FOODS, NUTRITION, AND HERBAL MEDICINE](#)



Supplementing your diet with wild foods will help you live a longer, healthier life. Most Americans are overfed and malnourished. We eat a diet high in calories and low in vitamins, minerals, and fiber, and we consume large amounts of artificial chemicals.

We use huge quantities of refined carbohydrates today—white-sugar and white-flour products. In Colonial times, white sugar was so rare that it was kept under lock and key. W

consume large quantities of meat, high in saturated fat and pumped full of carcinogenic growth hormones. Our early ancestors subsisted on irregularly available scavenged or caught lean wild game. They also collected plenty of edible wild plants.

Fiber is vital for a healthy digestive tract. Societies with high-fiber diets have much lower rates of cancer and heart disease, our two leading killers, than cultures on high-fat, high-refined carbohydrate diets. We can accurately call the white-flour baked goods we stuff into ourselves today the staff of death.

Turning to a whole-foods diet centered on complex carbohydrates, with plenty of fiber makes a big difference. Junk-food propaganda tells you sugar gives you “quick energy.” But it’s dissolved and brought into the bloodstream so quickly, it overtaxes the pancreas, which has to quickly produce inordinate amounts of insulin to metabolize this unnatural influx. The excess is stored as fat, and the energy is gone. You’re fatter—and soon become hungry again. As all dieters know, fat is very hard to break down.

The complex carbohydrates of whole grains and root vegetables, agricultural or wild, take hours to break down, so you get an even flow of energy, and stay full longer. This helps you stay healthier and makes it easier to keep off excess weight.

Wild foods have more vitamins, minerals, and fiber than anything else, so they combat the subclinical deficiencies, as do vitamin supplements. Wild foods also have all the enzymes and cofactors, some still undiscovered, that make the nutrients work better.

Free-radical-induced cellular damage is an important factor in aging, heart disease, and cancer. Cells derive their energy from the transfer of electrons incorporated in carbohydrates and fat fuels. But through a complex set of reactions, electrons can attach themselves to oxygen molecules and create free radicals—charged particles ready to neutralize their charge by taking or giving electrons to other molecules, and damaging them in the process. Free radical production can cause core genetic material to undergo mutation. This causes DNA to divide and reproduce improperly—a prime cause in aging, and a step toward cancer.

The enzyme xanthine oxidase, present in homogenized milk, produces free radicals that create lesions in the arteries, leading to heart disease. Margarine and low-quality oils produce free radicals that contribute to cancer. So do artificial preservatives, artificial colors (derived from coal tar), and artificial flavors. Foods that come from the earth, not ones that are manufactured, provide antioxidants that repair free-radical damage.

When we attune ourselves to the environment, and understand that we’re biologic products of this environment, we create a constructive context for understanding and taking charge of our planet and our health. The body heals many illnesses itself with proper nutrition (along with proper rest, exercise, and psychological/spiritual well-being). We use wild plants for health in two overlapping ways—as superior sources of nutrients, and as home remedies for minor health problems. People are often confused over whether a plant is a food or a medicine. Often, it’s both. Plants that cured deficiency diseases before we understood these ailments were thought to contain medicinal substances, whether or not they were also used as food. Today, we simply consider them to be highly nutritious foods. People treated scurvy with vitamin C-rich “medicinal” plants because they worked.

But you don’t need clinical vitamin-deficiency diseases to benefit from superior nutrition.

There's a big difference between the minimal vitamin levels required to stave off deficiency diseases in healthy adults (the basis of the Recommended Daily Allowance, or RDA) and optimal vitamin levels for people of different ages in varying stages of health. Chronic degenerative diseases don't begin the day the doctor identifies the first clinical sign or symptom. They develop over years. Although wild foods won't make you live forever, the extra nutrients often help forestall or prevent degenerative disease.

All foods consist of carbohydrates, fats, proteins, vitamins, minerals, fiber, and water. We break down these passive substances, absorb them, and use them for energy, as structural components, etc. Plants also make biologically active compounds for their own needs, and we exploit them as medicines. They actively affect our body chemistry, affecting specific organs or organ systems—they're more than just building blocks.

Drugs are also biologically active, but they're usually more concentrated, with more marked, immediate effects. Since toxicity varies with dosage (two tablespoons of table salt may be lethal), drugs are potentially more harmful, especially with longterm use. What drug companies call "side effects" are biologically identical to poisoning.

Using the same substances as both food and medicine seems strange in a society where medicines are normally drugs, and drugs are dangerous. In general, most edible herbs' active substances don't approach toxic levels. Still, some medicinal plants are dangerous, and everyone's needs are different, so you shouldn't start taking herbs helter-skelter.

Herbs' "active" ingredients are often concentrated to make drugs. One quarter of all drugs come from plants. However, the "inactive" ingredients seem to work together with the "active" ones in whole plants, making them safer. The entire complex of substances evolves together, so it makes sense that they interact chemically with one another. This is why I prefer herbs over drugs whenever possible.

For example, people used willow (*Salix* species) bark tea for centuries to reduce pain and inflammation. Small overdoses of the concentrated active ingredient, methyl salicylate, are toxic, so chemists transformed this extract to the less toxic aspirin, acetylsalicylic acid. But this convenient drug sometimes causes stomach ulcers, which you never get from the whole herb.

More concerned with speed and power than long-term harm, the medical-pharmaceutical establishment promotes concentrated drugs. Many doctors don't like herbs because you can't measure their dosage as precisely as you can do with drugs: If a leaf is genetically programmed with a million resin dots of active ingredient, and it grows in the shade, the leaf may get larger, to get more sunlight. It still contains the same million units as a smaller leaf growing in the sun, but at a lower concentration. A gram of shade-dwelling leaf will contain less medicine than a gram of the smaller sun-dwelling leaf. In some cases, the doctors are right: I'd rather take a measured dose of digitalis than foxglove (a very dangerous plant that digitalis comes from), because the foxglove might kill me. Unfortunately, American medicine ignores milkweed and hawthorn (pages 47 and 148), two much safer herbs that strengthen the heart. The recommended herbs in this book are safe, and the dangerous ones are clearly noted.

I'd rather you use plants without substances that approach toxic levels, when a little more or less isn't a matter of life and death. This is especially important for avoiding the inevitable

side effects of long-term drug use.

Conditioned by irresponsible TV commercials, Americans take drugs to suppress symptoms and disregard the symptoms' causes until the drugs' toxicity produces more symptoms. Then they take more drugs to suppress the side effects—great business for the drug companies.

Unfortunately, some people carry this thinking over to herbs. They want to know which herb will relieve their symptoms. Ideally, we need to determine what's wrong with us, use herbs, food, and other natural therapies to help the body heal itself, and take measures to stay healthy.

Things are never black-and-white. Conventional medicine, using drugs, is very effective for acute, life-threatening disease and trauma. Also, herbs can't diagnose your problem—a major factor people sometimes disregard. Those diagnostic procedures that are noninvasive (pregnancy tests, for example) provide invaluable information with no danger.

It's safe to treat yourself with safe herbs for those minor problems most people treat with over-the-counter medications, and, unlike drugs, you can interchange herbs that do the same thing. However, don't treat yourself with safe herbs for major health problems. The herb may not do you any harm, but the illness could kill you. After you become experienced with herbs, you can experiment with different combinations



HERBAL ACTIONS

Here are the major ways herbs affect the body:

Anodynes or *analgesics* are substances in plants that reduce pain. Some of the same plants also contain *antispasmodics*, which reduce muscle tension and cramping. *Nervines*, which calm the nerves, are also related. So are *soporifics*—substances that induce sleep.

Astringents make tissue contract. They're good for diarrhea, and as a gargle for sore throat. Some are also *hemostatic*—stopping bleeding. Externally, they're good for runny sores.

Alteratives are over-all strengtheners and detoxifiers, similar to tonics but directed toward helping people recover from illness.

Antiseptics, which you use externally, and *antibiotics*, which you use internally, interfere with microbial action.

Cardiacs are substances that strengthen the heart muscle. Don't use them without medical supervision. Even if they're safe, heart disease is dangerous without proper treatment and monitoring.

Carminatives are herbs that stimulate digestion and dispel gas. Different carminatives, or combinations, work better for different people. See which ones grow in your area, and determine what's best for you. In the nineteenth century, George Bizet wrote the opera *Carmen*. Since opera is not to everyone's taste, so the story goes, somebody likened the opera singer's voice to other,

less pleasant emissions of the human body, and named all herbs that work to dispel gas carminatives, after *Carmen*. The name stuck. However, an opera lover told me the word *carminative* comes from the verb *to card*, a form of purification, as in carding wool. Let your musical preferences determine which version you accept.

Demulcents are soothing substances you take internally. They usually contain mucilage, a form of fiber that absorbs water and protects damaged or inflamed tissues.

Diaphoretics are herbs that cause perspiration—good for fevers. We used to think you could “sweat out” fevers. This is oversimplified. Fever may be a symptom of an activated immune system, as is sleep: The immune system induces normal sleep. When it’s activated to fight infection, you become inordinately sleepy. Sleeping when you’re sick doesn’t make you better any more than sweating does. They’re both effects of an active immune system. Perhaps diaphoretics work by stimulating the immune system.

Diuretics stimulate the kidneys to increase the flow of urine. Pharmaceutical diuretics, the so-called water pills, are routinely prescribed to suppress high blood pressure, even though exercise, dietary modification, garlic, and meditation may better address the underlying causes. Diuretics, even natural ones, may leach valuable minerals through the urine, causing serious imbalances, so use them sparingly; find out why you’re retaining water and work on the cause.

Emollients are soothing substances you use externally, on the skin. Many contain mucilage.

Expectorants stimulate the lungs to expel mucus—very helpful for respiratory infections.

Emmenogogues promote menstruation. They often help the uterus contract, eliminate cramps, and induce menstruation to occur earlier. Harmful overdoses are still sometimes suggested to cause abortion. This is very dangerous, because you’re in effect poisoning yourself. Medical abortions are much safer.

Rubefaciants increase blood flow near the skin’s surface. They’re often used for arthritis.

Stimulants increase metabolism and circulation, often breaking up obstructions and warming the body. Strong stimulants, like caffeine, are harmful in the long run.

Tonics are herbs that strengthen the entire body. Because they’re nonspecific, medical science has a difficult time accepting that they’re real. This is changing because so much research on ginseng (*Panax* species), mostly overseas, shows that it works. (Ginseng isn’t listed [see page 1] because it’s much too rare to collect, and this wonderful medicinal plant has no food uses.)



HERBAL PREPARATIONS

There are a number of ways to prepare and use herbs:

Eating an herb is the simplest way of getting its medicinal benefits. This works best for plants you'd eat anyway, like chickweed or mint. However, the medicinal parts of some plants taste terrible.

Capsules are a good way to ingest bad-tasting herbs. Dry the herb, grind it into a powder, put it into a capsule, and swallow it. Note: Commercial capsules are made of gelatin, derived from cows' and pigs' hooves—not a good choice for animal lovers or vegetarians.

An infusion involves steeping the herb. Use this for relatively delicate herbs, like leaves and flowers, especially if they contain volatile substances that would be driven away by boiling. Add from one teaspoon to a small handful of fresh or dried herbs to one cup of water just off the boil. A glass or enamel container is better than a metal one, which could interact chemically with the herb. Cover the container and let the herb stand, away from the heat, 15 to 20 minutes. (Some people let infusions stand for hours.) Strain out the herb and drink the infusion. You can store an infusion in the refrigerator for several days.

There are other variations: You may chill some infusions, to serve cold. For very delicate herbs, you may want to try a sun infusion: Put the herbs in a glass container with room-temperature water, and let it stand in direct sunlight for a few hours.

In a *decoction*, you simmer the herb over low heat in a covered, nonmetal pot, 15 to 20 minutes. This is good for tougher, thicker plant material, like twigs, bark, and roots. There are exceptions. Twigs of black birch contain a volatile oil you'd lose by boiling, so you must make an infusion.

Douches of warm infusions or decoctions, applied vaginally, are commonly used for vaginal infections, such as Candida. Avoid routine use, because they may upset the healthy, natural balance of microorganisms.

A *tincture* is an alcohol extract. Fill a jar with an herb or herbs. Cover with vodka. Seal tightly, and let it stand for a few days or weeks. If you're mystically oriented, begin your tincture the night of a full moon, and strain out the herbs on the night of the new moon.

Use vodka because this is distilled alcohol, without impurities. Vodka is not 100 percent proof, so you're extracting both alcohol-soluble and water-soluble principles. Also, you're not using heat, which may harm some of the constituents. Because alcohol is the end product of microbial action, no further microbial action is possible, so a tincture doesn't spoil. However, light can

cause unwanted chemical reactions, especially over long periods of time, so store tinctures in the dark.

Alcohol is toxic to the liver, and it damages the stomach lining. It's rapidly converted to sugar, creating an undue demand on the pancreas for insulin. However, it has a low boiling point. To get rid of the alcohol, put one teaspoon to one tablespoon of tincture in one cup of water just off the boil. Let it sit, uncovered, 10 to 15 minutes, or until cool enough to drink. By then, virtually all the alcohol will have evaporated. (My apologies to the drinkers.)

A *compress* or *fomentation* is an external application. Wet a towel or cloth with an infusion or decoction, and apply it to the affected area. You can wrap it in plastic to keep the surroundings from getting wet. The compress may be hot or cold. Heat stimulates circulation, and cold reduces swelling and cools fever.

A *poultice* consists of warm, moist ground or powdered herbs applied directly to the skin, usually with a bandage. A *plaster* is similar, except the herbs are placed between layers of linen. These preparations draw out infections or irritants. You may mix the herbs and some warm water with clay or cornmeal to increase absorption.

A *salve* or *ointment* is a thickened, oil-based extract. Cook a handful of the herbs 15 to 20 minutes on low heat, just below simmering, in a quart of light oil (such as sunflower or safflower oil) in a glass or enamel pot. Strain out the herbs, and add two to three tablespoons of beeswax for thickness, plus the contents of an oil-soluble vitamin-E capsule—a natural preservative. Remove one tablespoon and cool to room temperature, to test the thickness. Add more beeswax or oil if you want it thicker or thinner. Cool, and store refrigerated, in jars.

Smoking herbs gets them directly into the bronchial tubes and lungs. You can use a pipe or water pipe. However, you're also inhaling carbon monoxide and ash, so this should be reserved for short-term emergencies.

A *syrup* is a concentrated herbal extract mixed with honey or glycerin—thick enough to remain in direct contact with the affected area: Gently boil down a quart of water with two ounces of herbs to about one pint. Strain out the herbs, and add one to two ounces of honey and/or glycerin. Syrups are used for sore throats and coughs. Black-cherry bark is the traditional herb of choice. Although honey is as unhealthful as white sugar, it's also a natural antiseptic, so a syrup is good to use for acute infection.





To know which plants are good to eat and which ones can kill you, you must make 100 percent certain identifications. A few plants, like dandelions and apples, are easy to recognize, but most require careful examination of identifying characteristics—those features that are stable throughout the species—especially if there are poisonous lookalikes. Some features are not shared by all members of a species. If you're trying to identify *Homo sapiens*, determining whether your specimens have freckles will distract you from what's important.

Before we look at plants' parts, and examine to see how their features vary, let's examine what's behind these features. Since Darwin, we know that living things gradually developed their forms because they worked, and more living things came into being than survived, so over countless generations, the ones that survived and reproduced the best are the ones we find. Anyone who's tried to rid a lawn of "weeds" knows how effective natural selection has been for producing organisms that survive and multiply.

Within that framework, almost anything goes. However, there are some influences and constraints. Everything must have a predecessor. Our middle ear, for example, is a greatly modified fish's gill arch. As our ancestors left the water, what had originally been part of a respiratory structure that could also conduct sound gradually changed into a specialized sound conductor. You can see still these changes paralleled in developing embryos, which start out with gill arches and end with the tiny hammer, anvil, and stirrup bones. If our early ancestors hadn't been fish, we might still be able to detect sound, but the mechanism would have been completely different.

On the other hand, if the anatomical or genetic raw material isn't available, certain lines of evolution are blocked. Woodpeckers evolved in North America because their ancestral form could be modified by natural selection into a bird that pecks for insects under tree bark. On other continents, insect-eating birds were anatomically incapable of occasionally pecking through wood, so woodpeckerlike forms never evolved, and insects hidden beneath the bark on other continents are safe from birds.

Still, nature's plasticity provides plenty to work with. Flower parts, for example, are highly specialized leaves that are modified for reproduction. Showy petals are still much like the ancestral leaves. They simply exchanged chlorophyll for other pigments, and changed shape and configuration—adaptations that attract pollinators.

Physical and biological laws also constrain evolution. Human ancestors developed ever larger brains, but this trend has stopped. Our babies' heads became so large that many women and babies died during childbirth, offsetting the advantage of a larger brain. We can't further enlarge the birth canal because our pelvis is already distorted in comparison to other hominids': Our leg bones already angle inefficiently to the side. The leg bones of our smallest brained immediate ancestor, *Homo erectus*, were placed below the pelvis. These creatures could probably run circles around us and outendure our best athletes. Some scientists think they stalked prey to exhaustion.

But nonbiological physical factors can also provide evolution with raw material: Repetition or variation on a theme, is a common organic and inorganic motif. Something that works worth repeating. Physically, if it's the course of least resistance, it probably will be repeated.

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