A SOUTHERN GATEWAYS GUIDE

Edible Wild Plants of the Carolinas

A Forager's Companion

Lytton John Musselman & Peter W. Schafran

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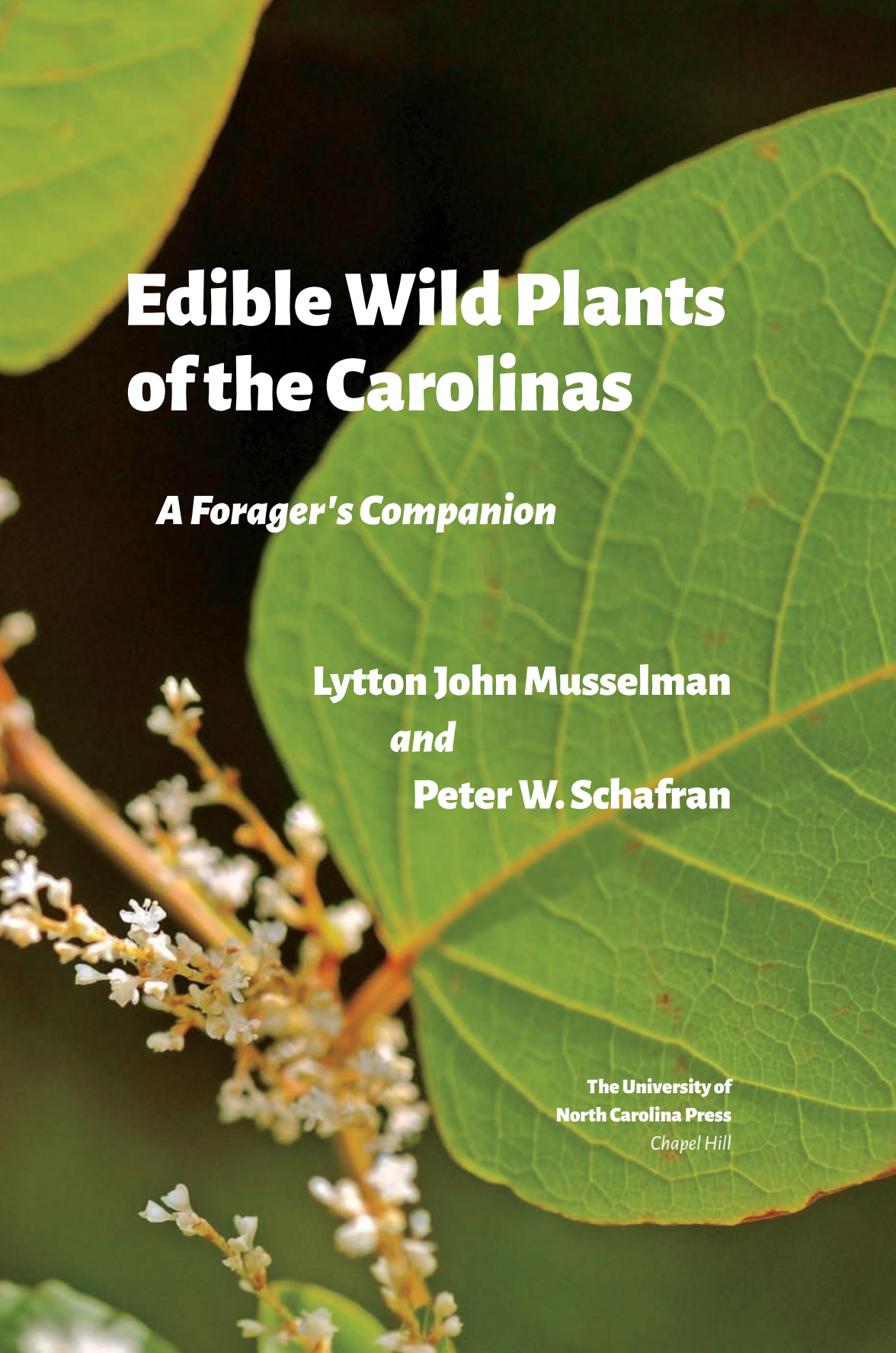

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The University of North Carolina Press
Chapel Hill

A Southern Gateways Guide

Designed by Jamison Cockerham
Set in Scala, Scala Sans, and Alegreya Sans
by Tseng Information Systems, Inc.

Cover: Highbush blueberry flowers. Photo by Lytton John Musselman.

Manufactured in the United States of America

The University of North Carolina Press has been a member of the Green Press Initiative since 2003.

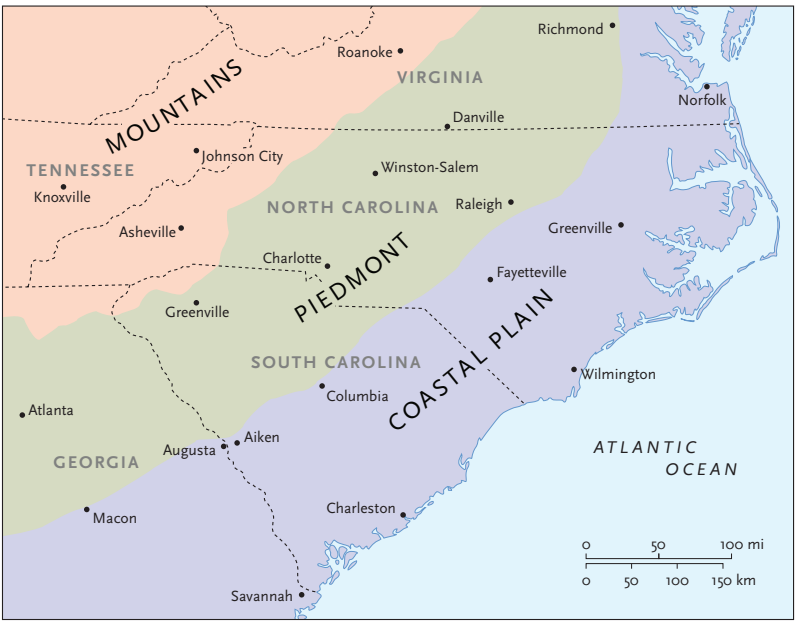
LIBRARY OF CONGRESS CATALOGING-IN-PUBLICATION DATA
Names: Musselman, Lytton John, 1943– author. | Schafran, Peter W., author.
Title: Edible wild plants of the Carolinas : a forager's companion / Lytton John Musselman and Peter W. Schafran.
Other titles: Southern gateways guide.
Description: Chapel Hill : The University of North Carolina Press, 2021. | Series: A Southern gateways guide | Includes bibliographical references and index.
Identifiers: LCCN 2021015302 | ISBN 9781469664965 (paper) | ISBN 9781469664972 (ebook)
Subjects: LCSH: Wild plants, Edible—North Carolina—Handbooks, manuals, etc. | Wild plants, Edible—South Carolina—Handbooks, manuals, etc. | Wild plants, Edible—North Carolina—Pictorial works. | Wild plants, Edible—South Carolina—Pictorial works. | LCGFT: Handbooks and manuals.
Classification: LCC QK98.5.U6 M865 2021 | DDC 581.6/3209756—dc23
LC record available at https://lccn.loc.gov/2021015302

Publisher's Note

Although *Edible Wild Plants of the Carolinas* includes information about the edibility of certain plants, it is the responsibility of the reader to ascertain the identity of plants found in the wild. If you are unable to safely identify a plant, don't use it. Any person choosing to consume or use the plants in this book does so at their own risk. Neither the authors nor the publisher are responsible for any undesirable outcomes based on information in this work. If there is any doubt about the identity or edibility of a plant, or if it's possible that you have an allergy to it, do not ingest or use the plant.

Contents


Edible Wild Plants of the Carolinas



For maps detailing where species described in this book may be found, please visit http://peterwschafran.com/CarolinaEdiblePlants.html.

Introduction

Welcome to Carolina foraging!

As we write this in early 2021, the pandemic has created a new coterie of foragers. The alarm of seeing empty grocery store shelves stimulated interest in alternative food sources, sending first-time foragers with newfound free time to the woods. We hope that the discussion of common but little-used or overlooked plants in this book may prove a helpful resource for those who want to do serious collecting for food—even after the end of the pandemic.

Before delving into the wide array of edible wild plants in the Carolinas, in this introduction we look at some basic issues surrounding foraging. We begin with warnings about common toxic plants such as poison ivy, as well as a caution about using edible plants that could be affected by unhealthy soils and a look at palatability as a separate issue from edibility. We can then safely discuss the kinds of foods wild plants produce (starches, greens, flavorings, oils).

Accurate identification is essential and a prerequisite for harvesting. Fortunately, there are excellent guides readily available to the Carolina forager, both books and online resources. Some of the ones we recommend are highlighted near the end of the introduction.

We hope our work will benefit both experienced and beginning foragers.

Caution! May Be Dangerous to Consume

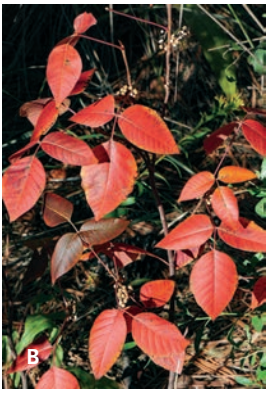
Accurate identification is essential if you want to be a successful and a long-lived forager. There are numerous very toxic plants in the Carolinas. The most deadly is poison hemlock (*Conium maculatum*). It is

A Poison hemlock's compound leaves look like fern leaves. **B** A roadside stand of poison hemlock with fruits just beginning to develop.

also the most important for foragers to recognize, both because it's easily confused with some related edible plants and because it has spread widely during the past decade, especially in the mountains. Hemlock seeds have been mistakenly harvested with fatal results. Interestingly, the plant has no relation to the eastern hemlock (*Tsuga canadensis*) or Carolina hemlock (*Tsuga caroliniana*), well-known trees of the mountains that actually have edible parts.

A A flowering stem of poison hemlock. **B** Flowering heads of poison hemlock with developing fruit heads in the middle. Compare these flowers with Queen Anne's lace. **C** Purple blotches on the stems are one of poison hemlock's diagnostic features (© Shutterstock/IanRedding).

A Poison ivy in the spring. **B** The bright-red foliage of poison ivy in the fall has led some well-intentioned gardeners to plant it as an ornamental. **C** A poison ivy plant in characteristic winter condition, with climbing stems and aerial roots attaching it to a tree.



Poison hemlock is a Eurasian plant notorious as the source of the poison that killed Socrates. It favors disturbed moist areas such as stream banks and roadside ditches. Poison hemlock has a carrot-like smell and seeds (technically fruits) that look like those of the related caraway (*Carum carvi*), cumin (*Cuminum cyminum*), and fennel (*Foeniculum vulgare*). The leaves are fernlike and compound, with bases that envelop the stem. A consistent and defining feature of the plant is the purple blotches on the stem (the word "maculatum" when used in a scientific name means "spotted" and refers to these blotches). Its flowers are small and white; they superficially resemble Queen Anne's lace but without the small red flowers in the middle of the flowering head. All parts of the plant contain coniine, a poison that affects the central nervous system, and are extremely toxic when ingested.

A dangerous plant virtually everyone is aware of is poison ivy (*Toxicodendron radicans* also known as *Rhus radicans*), though far fewer are able to confidently identify it. A forager should recognize this ubiquitous plant in both its summer and winter conditions.

Some plants with documented toxins and other harmful compounds are often described as edible. Among these are the common

milkweed (*Asclepias syriaca*), which contains cardiac glycosides, which affect the heartbeat. Another is wild yam (*Dioscorea villosa*), also common in the Carolinas, which contains diosgenin, which can cause gastric distress and other ailments. Bottom line: check trusted authorities for reports of toxicity before eating a wild plant for the first time.

Of course, these are not the only deadly or toxic plants you will encounter. There are many other poisonous or dermatitis-causing plants—these are only a few of the most widespread and dangerous. References such as *Toxic Plants of North America* (Burrows and Tyrl 2013) provide comprehensive information about toxic plants. North Carolina State University and Clemson University extension centers and local poison control centers also provide information about common toxic plants. Most importantly, when you're foraging, follow the adage "When in doubt, leave it out."

Outside Influences

Just because a plant growing in the wild is edible does not necessarily mean it is safe to eat. Numerous plants can accumulate heavy metals and sequester toxic herbicides. We hesitate to collect from roadside ditches and near golf courses because these sites are often heavily sprayed with pesticides and herbicides. Agricultural fields can have appealing populations of *Amaranthus* and *Chenopodium* species that are desirable for their greens and seeds but grow in soils often drenched in pesticides and with toxic levels of nitrogen. The soil must be healthy for the plant to be healthy.

Not all toxins that affect plants have human origins, of course. Some fungal toxins that infect other plants are extremely poisonous—in commercial food production, foods are carefully screened for these fungi. Of these, aflatoxins produced by the fungus *Aspergillus flavus* are perhaps the most widespread. To minimize contact with aflatoxins, collect only fresh seeds and fruits, not those that have been on the ground for some time, and be especially wary in hot, dry weather, which promotes this fungus. Look for a yellow-grey or greenish growth and discard any material that is discolored.

Edible and *Poisonous*

People are often surprised to learn that a single plant can have both edible and toxic parts. An example often used in ethnobotany classes is rhubarb (*Rheum* × *cultorum*). The petiole—the stalk that attaches the leaf to the stem—is valued (at least by Yankees) for its tart flavor, but the leaf blade is toxic; in Britain, there have been reported deaths associated with eating the leaf. Another example is ackee (*Blighia sapida*), a tree native to tropical West Africa that was introduced to Jamaica, where its fruit is now part of the national dish. The white aril (a specialized seed covering) of the ripe seed is edible and has a buttery consistency and mild flavor, but the unripe seed is toxic and even fatal.

There are several less-dramatic examples of Carolina plants with both edible and toxic parts. Pawpaw (*Asimina triloba*) has luscious (usually—see below) fruits, but other parts of the plant contain serious toxins. A less toxic example is ground-cherry (native species of the genus *Physalis*), whose edible fruits are surrounded by a poisonous husk.

Edible Is Not Always Palatable

Even nontoxic and harmless plants are not always palatable. The edible-plant literature is replete with descriptions of the edibility of the buds and flowers of the common water lily (*Nymphaea odorata*). Based on this, a class we taught at Cranberry Lake Biological Station in the Adirondack Mountains collected a partial canoe-load of buds. We tried them raw: extremely bitter. We boiled them: extremely bitter. We soaked them in wood ashes: extremely bitter. Back home in Virginia we collected buds from local plants and tried again: extremely bitter.

Such plant lore, though erroneous, is often unquestioned and repeated, frequently for generations. Bottom line: be critical of what is described as edible.

Unlike major food crops such as grains and legumes, which have been shaped by thousands of years of agriculture to have certain flavors, textures, yields, and to make them more manageable, wild plants have not been subject to artificial selection. Because they have not been subject to these selective pressures, they vary greatly in phenology, size, and flavor.

As an illustration, the flavor and sweetness of the pawpaw (*Asimina*

triloba) fruit can vary from plant to plant. Likewise, the stem tips of greenbriers (species of the genus *Smilax*) can have an asparagus-like flavor or be disgustingly bitter. A third example is southern amaranth (*Amaranthus australis*): one plant may have painfully bitter leaves while a neighboring plant tastes good.

Sharp and bitter flavors can have several sources, but most prominent are tannins and oxalates. The amounts of these compounds can differ from plant to plant and can enhance or inhibit the plant's use depending on concentration.

As their name implies, tannins have been used in tanning leather, a process of binding proteins in hides and thereby preserving them. Tannins are antibacterial and may also hinder fungal growth. Large quantities of tannins can interfere with digestion.

The role of oxalates in plants is uncertain, but they may be waste products of the plant's metabolism. After all, plants are much more discreet about waste management than animals—unlike animals, they have no excretory system—so metabolic waste products remain in the plant. While oxalates are often bitter, they can also have a pleasant sour flavor, and they are not harmful to most people in small quantities. However, anyone with kidney stones, which are commonly composed of oxalates, should avoid plants with oxalates.

Saponins, like tannins and oxalates, are bitter and can interfere with the palatability of plants. When mixed with water, saponins become frothy and soap-like. One possible role for saponins in plants is defense: the taste turns would-be munchers away and interferes with the metabolism of insects. Saponins are also slightly toxic to humans, but they can be removed by thoroughly rinsing the plant.

All these bitter compounds are harmless in small quantities but can limit palatability and, in larger doses, affect digestibility. Boiling plants in several changes of water usually removes at least some of these substances. To remove tannins, you can also soak plants in a solution of water and wood ashes (one cup hardwood ashes to four cups water). Take care to wash the plants thoroughly afterward to remove all the ash residue.

Kinds of Foods from Wild Plants

Starches Equal Survival

Long-term survival in the wild depends on finding starch sources. This is the reason that acquiring starchy plants is often a major focus of foraging classes and that starchy plants are emphasized in survival manuals.

However, in any given region, there are a limited number of substantial starch plants. Greens, on the other hand, may be readily collected from many deciduous trees as well as herbaceous plants. In our courses on edible plants, the emphasis is usually on starches, greens, and fruits.

Seasonings

The young shoots of sassafras (*Sassafras albidum*), collected in the early spring, can be powdered to make filé, a spice used in traditional gumbo. Dried leaves of the evergreen shrub red bay (*Persea borbonia*) are a good substitute for bay leaf (*Laurus nobilis*) and are available in any season. Ramps (*Allium tricoccum*) and other alliums make for pungent condiments. But the list of suitable plants for seasonings is short.

Teas and Alcohol

Virtually any nontoxic leaf or bark can be made into a tea. Our enthusiasm for these brews is limited, but the interested forager can find many suggestions online.

Fermented alcoholic preparations, however, are always intriguing. We have included cordials in this book because they are easily prepared and do not require distillation, which would require a license, and also because there's so little information available on using wild plants in cordials.

Traditional Native American Cooking

When it comes to living off the land, we are fortunate to have considerable data from people who were true hunter-gatherers: pre-Columbian Native Americans.

However, reproducing authentic traditional Native American recipes is difficult because they often require nonvegetal components that aren't readily available today, such as fat from buffalo and groundhogs. In a field ethnobotany course at Mountain Lake Biological Station, students harvested rhizomes of cattail (*Typha latifolia*), and it was explained that Native Americans likely cooked these in buffalo fat, which the class lacked—until one student brought fat from a buffalo butchery in his town. The medallions of cattail rhizome fried in buffalo fat were tasty. This raises the question of how other wild plants would taste if prepared with wild animal meat and fat. Realistically, native plant recipes seldom resemble the way those who had to live off the land prepared their food.

In the precolonial era, Native Americans domesticated a guild of native plants (Gremillion 2018), including sunflowers (*Helianthus annuus*), sumpweed (*Iva annua*), pit seed goosefoot (*Chenopodium berlandieri*), Carolina canarygrass (*Phalaris caroliniana*), and erect knotweed (*Polygonum erectum*), along with a few other species. This assemblage is known as the Eastern Agricultural Complex. Surprisingly, few books on edible wild plants highlight any of these. The first three were especially important in sedentary Native American settlements like Cahokia in Illinois, where caches of seeds and other evidence of intensive agriculture have been found (Fritz 2019).

New Uses for Wild Plants

It is unusual to find a new use for a native plant, and even more unusual to find a plant that has never been used for food.

One way to discover that a plant is edible is to find its edible kin in other parts of the world. Here are two examples. First, the World Vegetable Center in Arusha, Tanzania, which aims to reduce poverty and

malnutrition worldwide, promoted chaya (*Cnidoscolus aconitifolius*) as a nutrient-dense vegetable—yet in the United States, many botanists had assumed that its genus, *Cnidoscolus*, was toxic. In the Carolinas, this genus is represented by spurge nettle (*Cnidoscolus stimulosus*), and so, gingerly—because of the stinging hairs—it was collected, steamed, and eaten. Tasty. The seeds, though small, turned out to have a nutlike flavor. The second example is the use of sessile joyweed (*Alternanthera sessilis*) as a vegetable in Southeast Asia. The realization that it's in the same genus as alligator weed (*Alternanthera philoxeroides*), an invasive plant clogging canals in the southeastern United States, prompted the question, Is alligator weed edible? Turns out, it is.

Crop relatives may also lead to new usages. Fonio (*Digitaria exilis*), finger millet (*Eleusine coracana*), Japanese millet (*Echinochloa frumentacea*), and kodo millet (*Paspalum scrobiculatum*) are referred to as "minor millets" because they are limited in use compared to major grains, but they are important subsistence crops in restricted areas, especially in the semiarid tropics. Are their usually weedy relatives in our flora—hairy crabgrass (*Digitaria sanguinalis*), goosegrass (*Eleusine indica*), barnyard grass (*Echinochloa crus-galli*), and dallis grasses (*Paspalum* spp.)—worth foraging? The proverbial further research is needed.

We have been blessed with the temerity (perhaps bordering on recklessness) to try these and innumerable other members of the Carolinian flora, and we have learned, painfully at times, from these experiences. But experimenting is necessary to learn about foraging. Even the failures can lead to success in knowing which "edible" plants to avoid. Experimentation and patience—tempered with caution—are needed to find new edible plants. It is our hope that you will learn from our experiences and find your own uses for wild plants!

Foraging Best Practices

In addition to experimenting, there are several practices that will make for more successful foraging.

First, obtain permission from landowners and land managers before foraging. Collecting plants on state land is regulated in the Carolinas, and you need a permit to gather edibles in state parks, state forests, and some wildlife management areas. The same is true for national parks and forests. Harvesting plants and mushrooms for

Foraging Ethics

This book aims to help the interested forager to successfully make what they find in the wild edible or potable. But there is a question of ethics in foraging, one that goes beyond simply an individual being careful about what they might ingest.

Many experienced foragers know how cautious one must be not to harm the environment by overharvesting. For those in more urban environments, this could be especially important considering the relative lack of green space in a typical city compared to the more rural areas of the Carolinas. However, even in the countryside, just as in the city, a forager must exhibit restraint. Populations of plants should not be destroyed just to provide an exotic meal.

This is especially true for plants that produce tubers. For example, species of *Claytonia* (spring beauty) yield a very tasty tuber. When digging, leave some of the smaller tubers in the soil for the next season. Likewise, groundnuts (*Apios americana*) also have tasty tubers, and older plants have several tuber-laden rhizomes, enabling harvest without decimation. Be discriminating in what you take from nature.

We advocate for teaching students and the public to practice sustainable collection by showing the impacts of the overharvest of such desirables as ginseng and ramps, a downside of the "locavore" trend. A good example of sustainability is the Cherokee way of harvesting ramps in which only leafy tops are cut, leaving the bulb to allow the plant to survive.

Speaking of Indigenous cultures, the Carolinas are the original homes of many Native American cultures, including—but not limited to—the Cherokee, Sappony, Lumbee, and Meherrin peoples. The foraging practices of these trailblazing peoples are beyond this book's scope, but we recommend researching groups that emphasize these practices, like I-Collective, to learn more about their sustainable foraging.

Finally, make sure foraging is permitted on the land you plan to explore and respect the environment. Remember that others will come after you looking for the same edible plants.

eating is allowed in North Carolina Wildlife Resources Commission game lands. Checking before collecting is always a good idea. Going through the permitting process garners input from those familiar with the land: you'll often learn where the plants are located, how others may have used them, and other helpful information. Of course, permission should also be obtained before collecting on private land.

Second, be cautious and know your own limits. People vary as much as plants. Some people are simply more susceptible to gastric upset from plants. Others have allergies. If you are sensitive to some foods, avoid untested wild plants or, if you wish, taste only a small quantity—and do not swallow.

Finally, and most essentially, learn which plants are edible and how to prepare them. Be very cautious about experimenting by yourself. If you are a serious wilderness camper, know which plants are suitable to eat in an emergency and in which seasons they're available. Be familiar with the literature on edible wild plants.

About This Book

This book covers wild plants of North and South Carolina that can be used for food, flavoring, and/or drinks. This means we include only plants growing without cultivation, both native plants and those that have been introduced, some of which are weeds.

The Carolinian flora has a long history of botanical study, and the plants of North and South Carolina have been extensively documented (some of the best works are listed in the references section at the end of this book). With so many other accessible and authoritative resources for identifying plants, in this book we emphasize utility—what parts of the plant are edible and how to prepare them—rather than identification.

We have selected about 125 plants that grow wild in the Carolinas and are edible or can be used for flavoring. To be included in this book, plants must be both edible and palatable, as determined from literature research and our own studies. In addition, we have established specific criteria that plants must meet to be included.

First, the plant must be easy for the nonspecialist to identify. To aid in reliable, confident identification, we provide original images for every plant. This is a unique feature because we are using diverse plants to show diversity of species as well as diversity of preparations.

Resources for Identifying Plants

It's crucial to make sure you have properly identified the plants you plan to use for food. There are numerous authoritative identification guides to plants in the Carolinas. Our book has a limited number of plants, none of which are rare or unusual and all of which are easy to identify, so they all should be easily found in these guides.

Among the guides we recommend are the following:

- *Wildflowers of the Atlantic Southeast* by Laura Cotterman, Damon Edward Waitt, and Alan Weakley
- *Wildflowers and Plant Communities of the Southern Appalachian Mountains and Piedmont: A Naturalist's Guide to the Carolinas, Virginia, Tennessee, and Georgia* by Timothy P. Spira
- *A Guide to the Wildflowers of South Carolina* by Richard Dwight Porcher and Douglas Alan Rayner
- *Wildflowers of the Carolinas Field Guide* by Nora Bowers, Rick Bowers, and Stan Tekiela

A web search will yield online identification guides. The most useful for the Carolinas is Vascular Plants of North Carolina, hosted by the North Carolina Biodiversity Project and North Carolina State Parks, at https://auth1.dpr.ncparks.gov/flora/index.php.

Increasingly, we advise students in our plant identification courses to use plant identification apps. We recommend Seek by iNaturalist (www.inaturalist.org/pages/seek_app), which uses image-recognition technology to identify plants. Just take a picture of the plant and the app will search its very large database for a match. Submitting an image of the unknown plant to Seek to crowdsource its identification is also rapid and effective. The app has limitations, though, and it is advisable to corroborate your identification with an authoritative manual.

While these resources are efficient, they are not exhaustive in their coverage of the flora, and you're likely to find a wild

plant not in these guides. In that case, more comprehensive guides are needed.

For an authoritative identification guide produced by professional botanists, we recommend the app Flora Quest (www.floraquest.com), which is useful throughout the Mid-Atlantic states (however, you'll need an iPhone to use it). *Flora of Virginia* by Alan Weakley, J. Christopher Ludwig, and John F. Townsend, which contains most of the plants in this book, is a magisterial treatment of the plants of the Old Dominion and is also accessible through the Flora of Virginia app (https://floraofvirginia.org/flora-app). Finally, the classic *Manual of the Vascular Flora of the Carolinas* by Albert Ernest Radford, Harry E. Ahles, and C. Ritchie Bell is a dated but useful guide to the flora of both states. It documents county occurrences. A regularly updated flora covering the entire Southeast can be found in Alan Weakley's *Flora of the Southeastern United States*, available only in PDF format.

We selected the images to highlight distinctive features of the plants, based on the features that aided our students in identifying them.

Second, the plant should provide a suitable yield—enough for a meal. This is subjective, and there are cases where considerable effort is necessary for a particularly tasty, albeit small, harvest. And there are some plant foods small in yield that we have included simply because we find them fascinating.

Third, the plant should have a widespread regional distribution—that is, it should be found in collectible numbers in the Piedmont, Coastal Plain, Appalachian Mountains, and urban regions of the Carolinas.

Finally, foraging for wild food is recreational, so a species must not be rare and therefore in danger of local extirpation if harvested for a single meal.

Any guide to edible plants would have similar criteria, so what makes this book unique? For one thing, we highlight lesser-known species that are seldom, if ever, found in guides to edible wild plants. Many books emphasize well-known foods from plants, such as nuts

and berries, and while we do include these, they're not our focus. Rather, our aim is to show the tremendous diversity in foods that can be obtained from wild plants, especially those frequently overlooked for eating. We also emphasize novel uses for plants—in fact, some uses we cover have never been recorded. We want to encourage a greater appreciation of the wild Carolina flora. What is more intimate in the plant-human relationship than knowing which plants to eat? What activity could better connect us to our environment than foraging?

And finally, because we are teachers, we've aimed to produce a unique resource for teaching ethnobotany, one that makes clear the importance of domestication and artificial selection (Musselman 2019).

This Is Not a Cookbook

We are botanists, not gourmands, so there are few recipes in this book. Yes, we do include instructions for preparing cordials and aperitifs, and we mention a few favorite recipes we consider especially tasty or unique, but even these are general guidelines rather than detailed recipes. Rather, we envision this book as a guide to underappreciated plants that can be used in devising new recipes. It is a resource book, not a recipe book. We provide information about the plants; you prepare the food.

Some wild-plant recipes use the plants only to augment a dish whose ingredients include butter, cream, flour, sherry, sugar, and other components—the wild plant is only an adjunct. No wonder the foraged plant tastes good with these rich, overwhelming flavors! The plain truth is that wild plants taste different from the usual foods in our diet, and the difference is not always perceived as pleasant. Being an authentic forager means preparing foods in ways that highlight the dominant flavor of the wild plant.

About the Authors

We have personal experience researching, identifying, harvesting, preparing, cooking, and eating each of the plants in this book. Collectively, our experience extends over five decades and in the past years has emphasized the flora of the Southeast. This has meant field trips to many habitats in the Carolinas. Concurrently, we have also been teach-

ing field botany courses that include sections on edible wild plants. This research and teaching is the basis of our experience with edible wild plants, which we share in this book.

How This Book Is Arranged

We have arranged the chapters according to which parts of the plants are used. There is some overlap: some plants are included more than once because, for example, they may have edible flowers as well as starchy tubers, each treated in separate chapters. For simplicity's sake we have reduced these categories to shoots and leaves (including stems); flowers; nuts, seeds, grains, and fruits (in the culinary sense); roots, tubers, and bulbs (more or less culinary and botanical). Our treatment of fruits is small and focuses on nontraditional plants and novel uses. The section on cordials includes preparations from various plant parts.

Within these sections plants are arranged alphabetically by their common name. How common are these common names? There are no formal guidelines for the construction, use, and uniformity of common names, so we simply use the names that are common to us through local use and our personal preference, generally deferring to those in the Flora of Virginia app. For precision and accuracy, we also include scientific names. They are essential for effectively seeking further information on the plant in question.

Scientific names are usually of little interest to nonbotanists, but knowing something about nomenclature is helpful for understanding the dynamic system of plant naming, which is codified yet adaptable to renaming based on newly discovered genetic relationships. Two main components constitute the scientific name: the genus name and the specific epithet. Together these two parts make the single species name. For example, the scientific name of eastern redbud is *Cercis canadensis*: *Cercis* is the genus, *canadensis* is the specific epithet, and the species name is *Cercis canadensis*. Note that the singular name is composed of two parts.

Each plant entry includes images of the plant, the common name and scientific name, a brief description of salient and interesting aspects of the plant, information on habitat, and guidance on collecting and preparing food from the plant, along with some notes and opinions. We have assiduously tried to avoid botanical jargon, which

has, for example, seventy-five ways to describe the margin of a leaf and an even longer list of erudite terms describing hairs. We hope we've atoned for this botanical heresy with the care we have put into the images. The general distribution information is from the PLANTS Database maintained by the U.S. Department of Agriculture (plants.usda.gov) and from *Manual of the Vascular Flora of the Carolinas* by Albert Ernest Radford, Harry E. Ahles, and C. Ritchie Bell (1968).

Other Resources on Edible Plants

There are a plethora of books on edible wild plants for the eastern United States that are useful in the Carolinas. The most recent is *Southeast Foraging* by Chris Bennett (2015), which has color photos for all entries. On a much broader and more exhaustive scale is François Couplan's comprehensive *The Encyclopedia of Edible Plants of North America* (1998). This is the most complete list of wild edible plants for the United States and includes garden escapes as well as native plants. It has some black-and-white diagrams but no color photos. For the serious forager, the person who harvests and preserves wild plants as a consistent part of their diet, we recommend Samuel Thayer's *The Forager's Harvest* (2006). For a treatment of plants that can be prepared with simple recipes, see *The Quick Guide to Wild Edible Plants* by Lytton John Musselman and Harold J. Wiggins (2013).

A classic is *Edible Wild Plants of Eastern North America* by Merritt Lyndon Fernald and Alfred Charles Kinsey (1943). It has an authenticity about it, a feeling that the authors actually ate (or at least tasted) the plants and have honestly described the taste.

We've found that older guides mainly used the words "edible plants" in the title, while newer, trendier volumes favor the word "foraging". Perhaps this is good: a more inclusive term that embraces a wider community than just botanists. Or perhaps it reflects a return to local foods, part of the locavore movement—selecting foods deemed healthier because they are collected in nature (though, as discussed elsewhere

in this introduction, foods collected in nature may still contain toxins).

A rather obscure reference is *Cornucopia: A Source Book of Edible Plants* by Stephen Facciola (1990), which is a compendium of edible wild plants (biased towards western states) as well as a listing of cultivars of crop plants. The bibliography, which contains hundreds of entries, includes many references of value to the Carolina forager.

A valued web resource is Plants for a Future (https://pfaf.org), which has a series of online bulletins on an amazing array of plants—if a plant is edible, the treatment notes that, among other uses. While there is a temperate bias, the scope of PFAF is global. Today's foraging students have ready access to immense databases like this and numerous other web resources, so many depend less on the printed page.

Shoots and Leaves

The full panoply of wild plants providing edible greens would fill a volume on its own. In the Carolinas and throughout the Southeast, more plants can be used for greens than for roots or fruits. This is not surprising—leaves are the most obvious, abundant, and easily obtained plant part. Since it is not always easy to distinguish leaves from stems, we have also included shoots (young stems with developing leaves) in this chapter. As a rule of thumb, collect leaves when they are young and tender. For most species, this means before the flowers appear.

Describing the flavor of plants in this group is particularly challenging because most have a mild, if not bland, vegetal flavor—think steamed spinach. There are a few wild greens that have distinct flavor best experienced when eaten raw, and these are noted. Some greens in this chapter, though, are better cooked. In general, the presence of hairs makes leaves less desirable for salads. Boiling or steaming usually makes hairy leaves more palatable, especially when they're young. And many wild greens, like their cultivated counterparts, contain potentially toxic or unpalatable components that cooking renders nontoxic or more palatable—like the tannins and oxalates discussed in the introduction.

If you have a plethora of greens, consider dehydrating them so they keep longer. We use a dehydrator on the herb setting (95°F). Most greens will dry overnight, but species with thicker or more succulent leaves take longer. Dried greens can be stored in airtight jars or frozen for longer shelf life.

Alligator weed flowers and opposite leaves.

Alligator Weed *Alternanthera philoxeroides*

Alligator weed is a highly invasive aquatic plant that can cause trouble by clogging canals, parts of lakes, and streams. It is a perennial that roots from creeping, floating stems and is most frequently found in the Coastal Plain of North Carolina. Its leaves are fleshy and have a shiny upper surface. Collect the young stems before flowers appear. When they're fresh, their flavor is mild and slightly pungent. Cooking ruptures the air-filled tissue in the stem, so when you're boiling alligator weed, you'll know it's ready when the leaves sink. Their texture is pleasant and firm, with some sliminess.

A A grove of American beech trees with their characteristic smooth, gray bark.
B American beech leaves emerging from bud. This is the stage for collecting.

American Beech *Fagus grandifolia*

American beech is a common and well-known tree throughout the Carolinas, iconic with its diagnostic smooth, gray bark. It is common in the Piedmont and mountains, and with the suppression of fires in

the Coastal Plain, it is now widespread there as well. Leaves are alternate and have a corrugated appearance when young. At this stage they can be harvested, but it's best to boil them to soften the hairs on the leaves. The cigar-shaped scales that often cling to the leaves at this stage are edible but annoying, so remove them before eating. In the fall, the American beech produces nuts that are tedious to extricate from their spiny coverings but tasty.

A An American sea rocket habitat at the wrack line on a beach. **B** Flowers and developing fruits on an American sea rocket plant.

American Sea Rocket *Cakile edentula*

This plant has nothing to do with Cape Canaveral. The word "rocket" in this case is from *roquette*, the French word for arugula. Sea rocket is in the same family as arugula—the mustard family—and has hints of the flavor of arugula when fresh.

Sea rocket leaves are fleshy, a water-conserving adaptation to its harsh environment on the foredunes of beaches, where it can grow quite bushy and form large populations. Flowers have four petals and yield a fruit unusual in this family: a single seed enclosed in a corky waterproof and saltproof covering. The seeds are edible but tedious to remove from their casing. The leaves are best eaten raw, like arugula.

Basswood *Tilia americana*

Several trees native to the Carolinas have edible leaves that are palatable when they first emerge. One we recommend is basswood. Basswood is a common tree in the Carolina mountains, often growing in rich deciduous woods. Unlike most of the forest trees in the region,

A Basswood leaves at the stage for harvest, when they first emerge. They are tender at this stage but soon become stringy. **B** A mature basswood tree with the characteristic multiple trunks.

basswood can branch from the base, producing multiple trunks of uniform diameter. Leaves are alternate and widely ovate.

Collect the young leaves just as they emerge. They can be eaten raw or steamed. Their relatively firm texture makes basswood leaves good salad material.

A Even though this beaked corn salad population is flowering, the leaves and stems can be harvested for eating. **B** Flowering heads of beaked corn salad. Each is about the size of a dime.

Beaked Corn Salad *Valerianella radiata*

Corn salad is apparently named for a related species that grows as a weed among "corn" in England—but the British use the word "corn" to refer to wheat and barley; what Americans call corn, they call maize. The taxonomy of the corn salad genus is complex, and there are several species that grow wild in the Carolinas—all of which can be prepared the same way. Here we focus on beaked corn salad because it is most often found in large populations.

Found scattered through both states, beaked corn salad is an early spring annual found on roadsides and the margins of agricultural fields. It has opposite leaves and small white flowers with light-pink edges. Young, nonflowering plants are best for eating, but the entire plant can be eaten even in flowering and has a pleasant crunchy texture. The taste is unique but has overtones of walnut. Corn salad germinates and grows rapidly in the early spring, so watch for it early—it's easy to miss.

A A cross-section of a cattail stem showing the overlapping leaves. The thin, green leaves in the center are edible. **B** A population of cattails with several at the edible stage (green) and seed stage (brown), and bearing last year's fruits (cottony). **C** Only the very youngest cattail leaves are tender enough to eat. **D** Eager students with cattails harvested for their edible shoots.

Cattails

Common Cattail *Typha latifolia*

Narrowleaf Cattail *Typha angustifolia*

Southern Cattail *Typha domingensis*

Cattails are so important for the forager that they're covered twice in this book in some detail, here and in the chapter on flowers. They are abundant and very easy to identify, and they also have a very broad dis-

tribution, so they're easy for foragers to find. And all parts of the cattail are edible at some stage.

In addition to the three species named here, there are also hybrids of these growing wild. All are readily recognizable as cattails, and all can be treated the same way for food.

Harvesting the leafy stems of cattails is less onerous than collecting rhizomes, which have to be extricated from the mud. Harvest only stems from nonflowering or nonfruiting plants; flowering and fruiting plants do not have the requisite stem tips. The mature leaves of cattails are strong and fibrous, making them useful for baskets and cordage but not so good for eating. It's only the very young leaves that are tender and tasty. Peel away the long, mature leaves until you reach the light-green or white inner leaves.

If they can be easily torn, the young leaves are tender enough to eat raw. They have a delicate, cucumber-like taste. If they cannot be easily torn, try them steamed instead—they are an interesting addition to a mixed vegetable dish. For a salad, use only the very youngest leaves. These have a slimy surface that can be rinsed away before eating.

A A chickweed plant in late winter. **B** Chickweed flowers and buds. The petals are deeply divided, making five petals look like ten petals. **C** Chickweed and capsules with tiny seeds.

Chickweed *Stellaria media*

Chickweed is one of the most abundant winter weeds in agricultural fields after the fall harvest of crops. Each year in the Carolinas there

are innumerable acres of chickweed, especially in regions without heavy freezes.

This invasive plant from Europe is a short, spreading winter annual that germinates in the fall and matures through the winter. It has opposite simple leaves and small white flowers with five deeply incised petals giving the appearance of ten petals. Large quantities of the plant can be harvested in late winter. Cutting rather than pulling the chickweed reduces the effort of removing soil from the plant. Plants should be cooked to denature the bitter-tasting and soap-like saponins (common in several edible plants). In Europe, chickweed is eaten raw in green salads.

The seeds are tiny, but large quantities can easily be gathered and germinated at room temperature for a kind of microsprouts.

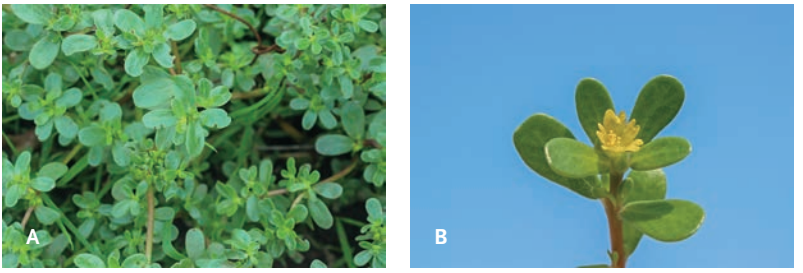
A Chicory flowers. The blooms close by midafternoon. **B** Young chicory shoots collected as a vegetable (© Shutterstock/ermess). **C** Sprouting chicory plants with taproots.

Chicory *Cichorium intybus*

Chicory is a tall (up to three feet), erect, somewhat woody, perennial herbaceous plant that produces bright-blue flowers throughout the growing season. Varieties of chicory are cultivated for salad leaves, chicons (blanched buds), or roots, which can be baked, ground, and used as a coffee substitute or additive. When the shoots are less than five inches tall, they can be harvested for use in salads (though shoots

from some plants are very bitter). Harvest leaves when they're very young; they become stringy as they mature.

Chicory is grown commercially for the production of inulin, a polysaccharide food additive that improves texture and taste. The presence of chicory in North America is likely due to its introduction as a vegetable.



A A cleistogamous purslane with developing fruits. Flowers are few and hidden from view. **B** A flower on a chasmogamous purslane plant.

Common Purslane *Portulaca oleracea*

Purslane is one of a guild of weeds that was probably introduced to North America as either a crop or a contaminant in crop seed or ships' ballast. In this way purslane is similar to dandelions, chicory, and chickweed—all were once crops and have become weeds. Purslane is grown as a crop in the Middle East and North Africa, where it is known by the Arabic name *rigla*. Traditional spring salads in Syria feature purslane.

Purslane is widespread in the Carolinas and favors circumneutral to basic soils. Leaves are alternate but often clustered at the stem tip.

Common purslane has two modes of reproduction. Some plants do not produce obvious flowers. These are called cleistogamous because the flowers are few and hidden to view ("cleistogamous" means "hidden reproduction"). Chasmagamous plants, on the other hand, produce small yellow flowers ("chasmagamous" means "open reproduction"). All parts of the plants of both forms are edible raw or steamed.

A related species, *Portulaca amilis*, a weed from South America, is spreading in the Carolinas. Plants we have sampled are bitter.

A dense population of young common threeseed mercury plants ready for harvest.

Common Threeseed Mercury *Acalypha rhomboidea*

This is a widespread garden weed throughout the Carolinas. Harvest the plants when they are less than five inches tall. They are easy to pull up, but cutting the stems at the soil level saves the additional work of cleaning the soil from the plant. Because of its hairs, threeseed mercury is not suitable for eating raw: boil it for a minimum of ten minutes before eating. The taste is unremarkable.

A Curly dock in late-winter condition. **B** Flowering stems of curly dock in early spring.

Curly Dock *Rumex crispus*

This mildly invasive weed is common throughout the Carolinas. It can form extensive stands in open, disturbed areas. A rosette of spear-shaped leaves develops during winter; this is the best stage for harvesting. Leaves collected later will be tough and fibrous.

Like those of other plants in this genus, curly dock's leaves contain varying amounts of oxalates, compounds that impart a pleasantly sour, lemony taste but that in large quantities can be unhealthy. Cooking reduces the oxalate content.

The fruits, which look like seeds, can also be harvested; see the entry under "Seeds" in the chapter on nuts, seeds, grains, and fruits.

Dandelions in early spring, when the leaves can be harvested.

Dandelion *Taraxacum officinale*

What lawn and garden weed is better known than the common dandelion? But it's very likely that dandelions didn't depart their European home as a weed. No doubt they were introduced to North America as a vegetable: dandelion leaves were commonly used raw in salads or steamed and served as vegetables. There has been a resurgence in the use of dandelion leaves in recent years, as evidenced by their presence in bagged salad mixes found at the grocery store.

The leaves on a dandelion plant all arise from the base, have a milky latex, and are prominently toothed (giving rise to the plant's name, which is derived from *dent de lion*, French for "tooth of a lion"). Its flowers are very small and aggregated into dense heads, creating the appearance of a single yellow flower. Its roots can be roasted and ground and used to make a coffee substitute. A fermented drink, dandelion wine, can be made from the flower heads. Our enthusiasm for both drinks is limited.

Devil's Walking Stick *Aralia spinosa*

Devil's walking stick is not a name that conjures up thoughts of haute cuisine, yet this relative of ginseng is more than the best-armed and largest-leafed shrub in the Carolinas: it is also a tasty vegetable. The very young leaves are easily harvested, simple to prepare, and have a unique taste. The related *Aralia cordata* is a popular Asian vegetable.

Devil's walking stick is widespread in the Coastal Plain. Find a population of this denizen of low woods and plan to collect it around

A The emerging terminal leaves on this devil's walking stick in early spring are ready for collecting. **B** Flowering devil's walking stick shrubs in midsummer.

the first week of April, or just as the terminal bud is breaking and the expanding leaves are no more than five inches long. The young leaves and the bud will easily snap off the stem. The plant grows quickly past this stage, however, and harvesting must be done before the prickles mature on the leaves.

The leaves can be chopped and boiled. After boiling they have a broccoli rabe flavor.

A Field pansies growing as lawn weeds. **B** Field pansies are short-lived annuals. The wintergreen flavor is strongest in the roots.

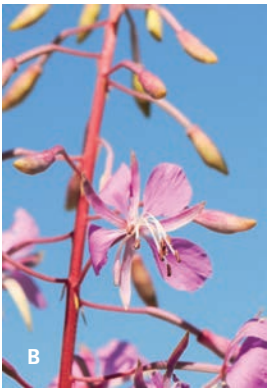
Field Pansy *Viola bicolor*

One group of herbaceous plants available for harvest in early spring are violets, the general name for all species of the genus *Viola*. All violets are reported to be edible, with leaves that can be prepared as potherbs. However, the taste of most species is underwhelming—but field pansy, also known as Johnny jump up, is different.

Field pansies frequently form large populations in lawns and agri-

cultural fields through much of the Carolinas. Unlike the majority of its relatives, this violet is an annual. The entire plant can be harvested.

Among all the violets, this is the only one in our flora that contains wintergreen oil. While the wintergreen flavor is much weaker than what's found in the native wintergreen (*Gaultheria procumbens*) or several birch species (genus *Betula*), field pansy plants are still pleasantly flavored and make a good—and unique—snack. Whole plants can be candied by coating them with egg whites and then dusting with powdered sugar, then dehydrating them or freezing them for later use.



A A flowering fireweed stem with maturing fruits.
B Fireweed flowers.

Fireweed *Chamerion platyphyllum*

This is a mountain species in the Carolinas and is widespread in boreal regions around the globe. Its taxonomy and nomenclature are unsettled, and the plant goes by several names. But it is easy to recognize: it grows up to five feet tall and features showy pink flowers on a leafy stem. The plants bloom in midsummer. The young shoots are tasty but need to be harvested before flower production or they are stringy and tough.

Fireweed shoots have been harvested and eaten for thousands of years, as was proven by the remnants found in the stomach of the remarkably preserved Tollund Man when he was discovered in a peat bog near Silkeborg, Denmark, in the 1950s—more than two thousand years after his death.

Garlic mustard in early spring. This invasive plant behaves like a native spring ephemeral, flowering early and rapidly producing fruits.

Garlic Mustard *Alliaria petiolata*

This plant is bad news for native North American plants. Garlic mustard came to North America from Europe over a century ago and is now a major threat to the integrity of several plant communities. It's especially invasive in deciduous forests, where it displaces well-loved native spring ephemerals.

Perhaps the only redeeming feature of this annual of the mustard family is the fact that it can be eaten. Like its relatives, it has four petals, and in this species, the flower produces a long, narrow seed capsule. Harvest the leaves before the flowers appear. They can be used raw—judiciously—or boiled. As its name implies, garlic mustard smells and tastes like the unrelated garlic (*Allium sativum*) and should be used sparingly as a flavoring agent because of its overwhelming taste.

Geraniums

Carolina Geranium *Geranium carolinianum*

Wild Geranium *Geranium maculatum*

These are not the geraniums grown in gardens. They're not even in the same genus—garden geraniums are species of the genus *Pelargonium*—though they are in the same family. These charming native plants are true geraniums.

Carolina geranium and wild geranium are found in different habitats. Wild geranium is found in rich deciduous forests, most commonly in the mountains, while Carolina geranium generally occurs on roadsides, fields, and other disturbed areas throughout the Carolinas. The leaves of both species are similar in morphology but differ

A Wild geranium leaves in early spring, when they can be harvested. **B** A wild geranium in flower in late spring. **C** A Carolina geranium in flower.

in size: Carolina geranium leaves are one-half to one-quarter the size of wild geranium leaves. Their flowers are also generally alike but differ in size and color.

Collect the leaves in early spring, soon after they appear. Boiling makes the leaves of both species more palatable as a potherb. We think wild geranium leaves have a better flavor, but in deference to the Carolinas, we have included the eponymous Carolina geranium.

Glassworts

Dwarf Glasswort *Salicornia bigelovii*

Jointed Glasswort *Salicornia virginica*

Woody Glasswort *Salicornia ambigua*

Glassworts are true halophytes, able to thrive in highly saline habitats where little else can grow. In the Carolinas, these succulents are restricted to coastal marshes. They are called glassworts because, from ancient times until relatively recently, they were harvested and burned to create sodium carbonate (washing soda), which was used to make glass. Glassworts are no longer used in glass manufacturing—instead, they're considered a gourmet food.

On both sides of the Atlantic glassworts, have been harvested as

A Dwarf glasswort (*Salicornia bigelovii*). **B** Woody glasswort (*Salicornia ambigua*). **C** Jointed glasswort (*Salicornia virginica*) in its typical autumnal color.

a vegetable for many years because of the pleasantly salty flavor of the stems. The leaves are small and scalelike and cover the stem. In France they are known as *haricots de mer*, "green beans of the sea," and are sold to fancy restaurants that often serve them with fish. Lacking the élan of gourmands, we have simply used them as a vegetable or pickled them in a basic pickling brine (one cup water, one cup white vinegar, two tablespoons salt). Pickled glasswort can be kept for up to two years.

Goosefoot

Lamb's Quarters *Chenopodium album*

Pit Seed Goosefoot *Chenopodium berlandieri*

Goosefoot is one of the tastiest of all wild greens. The young leaves of this widespread weed are distinctively whitened by the presence of

A Common goosefoot plants near flowering. **B** The youngest leaves on this common goosefoot plant are pale because they're covered in hairs.

tiny water-filled hairs. Unlike many plants with hairy leaves, they can be eaten raw; they have an umami flavor. Leaves can be boiled and eaten as vegetables. Harvest the leaves before the tiny flowers are produced at the top of the plant. The black shiny seeds are also edible and nutritious, like those of the plant's South American relative, quinoa (*Chenopodium quinoa*).

The common name "goosefoot" refers to the shape of the older leaves. The provenance of common goosefoot is debated: some research indicates it's native to North America, while other studies point to a European origin.

Pit seed goosefoot, on the other hand, is native to the Carolinas. It's presently most common in coastal areas, where it grows in saline soil. It was once used extensively by Native Americans in the eastern United States for its greens and especially for its nutrient-dense seeds (see the chapter on nuts, seeds, grains, and fruits). Pit seed goosefoot can grow into a large, shrubby plant even though it is an annual.

A Flowering pit seed goosefoot. **B** Note the red on the stem, characteristic of pit seed goosefoot.

Pit seed goosefoot leaves are small compared to those of common goosefoot, but they are also tasty. They can be eaten raw or steamed, like spinach.

The tender stem tips and young leaves of green amaranth are harvested at this stage.

Green Amaranth *Amaranthus hybridus*

Frequently found, often in abundance, at the edges of agricultural fields, green amaranth is an annual weed with alternate leaves. Its leaves should be harvested before the masses of small greenish flowers are produced. All the Carolina species are edible, but at least one species is armed with prickles. Amaranth is one of the tastiest greens, best eaten as a cooked vegetable.

Amaranth is nutritious, and some species are being widely planted for their seeds (often referred to as a grain) as well as for the foliage, which is a healthy vegetable. However, you do not want to eat even a nutritious plant that has been marinated in herbicides. Therefore, ensure that the plants you harvest are from healthy soil.

Greenbriers

Catbrier *Smilax bona-nox*

Laurel Leaf Greenbrier *Smilax laurifolia*

Greenbriers entrap botanists and other outdoorsy people with their stout prickles, which are capable of penetrating thick clothing. There are approximately ten species that are woody vines (a few species are not woody) with alternate simple leaves. They grow in a diversity of

A Laurel leaf greenbrier in early spring with tender terminal stems ready for harvest. **B** The terminal stem on a catbrier plant.

open habitats in the Carolinas and produce long, succulent edible shoots in the spring.

Catbrier is found in a variety of habitats in the Coastal Plain, Piedmont, and mountain regions. In our experience, the shoots of this species, though less fulsome, are also less bitter.

The largest shoots are those of the laurel leaf greenbrier (also known as blaspheme vine because of its effective armament), a common species in the Coastal Plain in low, wet areas.

Shoots resemble asparagus in texture and taste. We prefer them steamed.

A Mature halberd leaf orach grows in an irregular, spreading form. **B** Developing fruits on a halberd leaf orach plant.

Halberd Leaf Orach *Atriplex prostrata*

Halberd leaf orach is a true halophyte, a plant that can grow in saline soils. So it is not surprising that it is most abundant along the coast,

where it inhabits edges of salt marshes and naturally or artificially disturbed areas. Halberd leaf orach has alternate, succulent (fleshy) leaves, and its flowers are inconspicuous. The raw leaves are good in salads, where they add saltiness, or boiled as a vegetable.

A A large roadside specimen of Japanese knotweed in flower.
B Japanese knotweed flowers.

Japanese Knotweed *Reynoutria japonica*

This perennial from aggressive rhizomes spreads rapidly and favors disturbed areas, especially roadsides. Though invasive, its young shoots and leaves have value as edible plants. Unlike most edible wild plants, Japanese knotweed usually continues to produce new leaves throughout the growing season. They have a sour-lemony flavor that comes from a high quantity of oxalates, so all plant parts should be boiled before eating—and they should be avoided entirely by anyone with kidney stones or rheumatoid arthritis.

Leaves are alternate, and plants can reach six feet tall. Japanese knotweed is a dioecious species, meaning that each plant is either male or female, though the male (staminate) and female (pistillate) flowers appear similar. Japanese knotweed is expanding its range in the Carolinas.

A Despite its wilted appearance, this is a healthy stand of large-flower bellwort. **B** The drooping flowers were thought to resemble the human uvula of the soft palate, hence the genus name.

Large-Flower Bellwort *Uvularia grandiflora*

Look for this spring ephemeral in rich deciduous forests, especially in the mountains. Healthy plants often have a wilted appearance and should be harvested before the flowers open. Cut the stems rather than pulling up the plant to avoid destroying the plant. Leaves can be eaten raw and have a bland, nondescript taste. Developing stems can be steamed like asparagus, a more flavorful use of the plant.

A Common mallow leaves. **B** A common mallow flower. **C** A high mallow plant.

Mallows

Common Mallow *Malva neglecta*

High Mallow *Malva sylvestris*

This tasty weed from Eurasia is seldom highlighted in guides to edible plants, perhaps because it grows in waste areas, barnyards, and lawns—not the favored haunts of plant foragers. But the leaves, about the size of a half-dollar, are among the tastiest of our wild greens, with an okra-like flavor as well as the okra mucilage, disparagingly referred to as "slime." The mucilage is what makes common mallow good for thickening soups.

Common mallow is a popular edible wild plant in the Middle East, where its Arabic name is "khobasa," also the name of the typical pita bread of that region, in reference to the shape of the semicircular leaves. In Kurdistan, boiled leaves of tolaka (*Malva neglecta*) are a ubiquitous springtime dish. Veins on the leaves extend from the base.

High mallow is much less common in the Carolinas than common mallow, but it's eminently edible. Its leaves resemble those of the related okra (*Hibiscus esculentus*).

A flowering Maryland meadow beauty. Its leaves are opposite.

Maryland Meadow Beauty *Rhexia mariana*

Species of meadow beauty live up to their common name by displaying bright colors in open sunny areas, chiefly in the Coastal Plain. The large pink petals usually fall by noon, leaving the distinctive, urn-shaped developing fruits. Leaves are opposite and simple in these perennials.

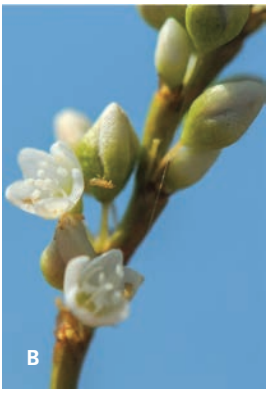
Unlike many other greens we recommend, meadow beauty leaves should be eaten uncooked to experience the pleasant sour aftertaste, though their stiff hairs may be off-putting. They go well in a salad.

A fruiting and flowering melonette.

Melonette *Melothria pendula*

Melonette is a healthy edible vine that may be growing in your garden as a weed. It is a widespread native annual with simple leaves that alternate with coiled tendrils. Flowers are small and yellow, and they produce a fruit that, when green, looks like a tiny watermelon (see the chapter on nuts, seeds, grains, and fruits). Like those of some other members of the cucumber family, the growing stem tips are edible and tender, and they have a pleasant umami flavor. Several members of this family also have edible shoots. For example, in Nepal the growing tips of pumpkin vines are regularly harvested as a vegetable. Melonette stems are just as tasty as pumpkin shoots, though it takes many of the vines to make a meal.

Melonette is easily confused with the perennial vine yellow passionflower. Not to worry: the young stem tips of this close relative of passionflower (see the chapter on flowers) are also edible, though in our opinion they have a less desirable taste that's exacerbated by bitterness in some plants.

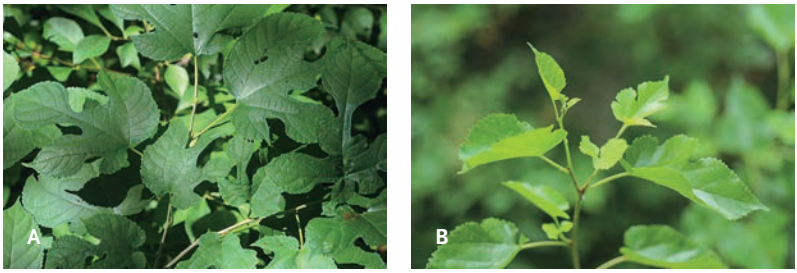


A Mild water pepper growing in a ditch. **B** Mild water pepper flowers.

Mild Water Pepper *Persicaria hydropiperoides*

All species of *Persicaria* are edible and have a pleasant tangy flavor due to the presence of oxalates, the compounds that also flavor rhubarb, among other plants. The dozen or so species of *Persicaria* found in the Carolinas, including mild water pepper, are also sometimes called smartweed. These species all have simple leaves with distinct leaf bases that surround the stem, and some species are viciously armed with prickles. Their flowers are small and pink or greenish-white, and some species have more than one color. However, not all these species are as palatable as mild water pepper.

Mild water pepper is a perennial most common in the Coastal Plain, where it often occurs in dense patches. Use young leaves and shoots, which can be eaten raw or boiled. Boiling reduces the oxalates, which in large quantities can produce kidney stones and affect arthritis.



A A red mulberry with mature leaves. **B** A white mulberry with young leaves suitable for harvest. The shiny surface of the leaf is characteristic of this species.

Mulberries

Red Mulberry *Morus rubra*

White Mulberry *Morus alba*

Red mulberry is the only member of the mostly tropical fig family native to the Carolinas. White mulberry, on the other hand, was introduced. This is a large and diverse family, especially in the tropics, and includes such edibles as figs (species of the genus *Ficus*) and jackfruit (*Artocarpus heterophyllus*). The leaves of both white and red mulberry are edible and are best harvested when young, before they become fibrous. Collect the leaves at the same time as the flowers are pro-

duced. The leaves are equally mediocre raw or cooked. (See also the chapter on fruits.)

A spurge nettle plant with its characteristic leaves.

Nettles

Spurge Nettle *Cnidoscolus stimulosus*

Spurge nettle is a perennial found in sandy sites in the Coastal Plain. These plants are understandably overlooked as food because of their stinging hairs and because of their well-known toxic relatives such as castor bean (*Ricinus communis*), the source of the toxin ricin. Further study suggests spurge nettle is edible, however, as is its Central American kin, chaya (*Cnidoscolus aconitifolius*), a promising nutrient-dense crop for tropical areas.

Harvest spurge nettle leaves in early summer, and be sure to wear gloves—latex or leather is best because the stinging hairs can pierce cotton. The presence of these very effective armaments means spurge nettle leaves must be cooked. Steam or sauté them until tender. The taste is mild yet distinct, rather like Swiss chard.

While we have not tried them, the roots are reported to be edible, but harvesting them destroys the plant. Spurge nettle seeds are edible and tasty (see the chapter on nuts, seeds, grains, and fruit).

Wood Nettle *Laportea canadensis*

When you're gathering plants to eat, harvesting plants with stinging hairs seems counterintuitive. Yet arguably some of our tastiest and most nutritious leaves are from these armed plants.

Wood nettles grow in moist woods along streams throughout the Carolinas and is most common in the mountains. Its leaves are alternate and its flowers are unisexual, small, and greenish. Use gloves

A Wood nettle leaves can be harvested at this stage. **B** Stinging hairs cover the wood nettle plant. These can be disarmed through boiling.

when collecting wood nettle because of its abundant stinging hairs. These hairs will cause only mild irritation in most people and are disarmed by boiling.

One of the appeals of gathering wood nettle is that it grows in often-pristine habitats, unlike the common nettle (*Urtica dioica*), which is usually found in disturbed areas.

A Ox-eye daisies in a flower garden. **B** The younger, succulent leaves of an ox-eye daisy can be used as a salad green.

Ox-Eye Daisy *Leucanthemum vulgare*

Both a garden subject and a widespread weed, ox-eye daisy is used in Japan and China as a vegetable and in salads. Its leaves are alternate and its flowers are in a dense head, giving the appearance of a single flower. The leaf size and shape varies among the various cultivars. The taste also varies, but it generally has a slight menthol-lemon flavor. Some cultivars can be quite pungent, so sample what you collect before committing to a bowlful.

A A stand of poke in the spring. The leaves should be harvested at this stage or earlier. **B** Grapelike clusters of poke fruits. These are not edible.

Poke *Phytolacca americana*

Few wild edible plants are as familiar and widely used as poke, sometimes called poke salad. This very common native weed is a hearty perennial with large alternate leaves. It's found in open weedy sites throughout the Carolinas.

All parts of the plant are toxic before cooking, which breaks down the toxins. Harvest the shoots before the small white flowers appear and boil them in a large quantity of water, then replace the water and boil them again. A traditional Carolina way of fixing poke is to take the leaves after the double boiling and sauté them in a skillet with fatback or streak o' lean. The taste is unremarkable—not surprising, since it has to be boiled into submission to be eaten.

The attractive purple berries appear in mid to late summer and are not edible but make an excellent dye for wool.

A dense population of young rampion bellflower leaves ready for harvest.

Rampion Bellflower *Campanula rapunculoides*

The well-known fairy tale of Rapunzel is named after this plant (see the discussion in the chapter on roots, tubers, and bulbs). How to use

the leaves of this bellflower is less familiar. Rampion is a weedy introduction from Europe, like dandelion, chicory, and other vegetables that have become invaders. When eaten fresh, the leaves have a slight tang, perhaps due to oxalates. This flavor disappears when they are boiled.

Rampion is an uncommon garden escapee in the northern North Carolina mountains.

Ramps that have been harvested in early spring for their tender, tasty leaves.

Ramps *Allium tricoccum*

Ramps are one of the best-known wild edibles of the Appalachians—they're even the subject of annual festivals. And no wonder: ramps have a tasty flavor like an onion, but milder. One of its lesser-known common names is "wild leek," which better describes the flavor of this denizen of mountainous hardwood forests.

The life history of this delicacy is unusual. The leaves appear in early spring and then wither. Later in the year, globe-shaped masses of white flowers appear on a stalk, with no evidence of the leaves remaining. Harvest the leaves in early spring, when so many spring ephemerals are blooming. We think they are best fresh, but they're also tasty when steamed, and they are easily dehydrated.

Ramps suffer from overcollecting during the frenzy of spring foraging festivals. This damage shows the need for sustainable collection and the downside of the "locavore" trend (in which, for example, ramps are featured in every Brooklyn hipster pizzeria). A good sustainable harvest method is the Cherokee way of harvesting ramps: the leafy tops are cut off, leaving the bulb to produce a crop the following year.

A A grove of sassafras shrubs with a diversity of leaf shapes and lobes. **B** Young sassafras leaves suitable for making filé.

Sassafras *Sassafras albidum*

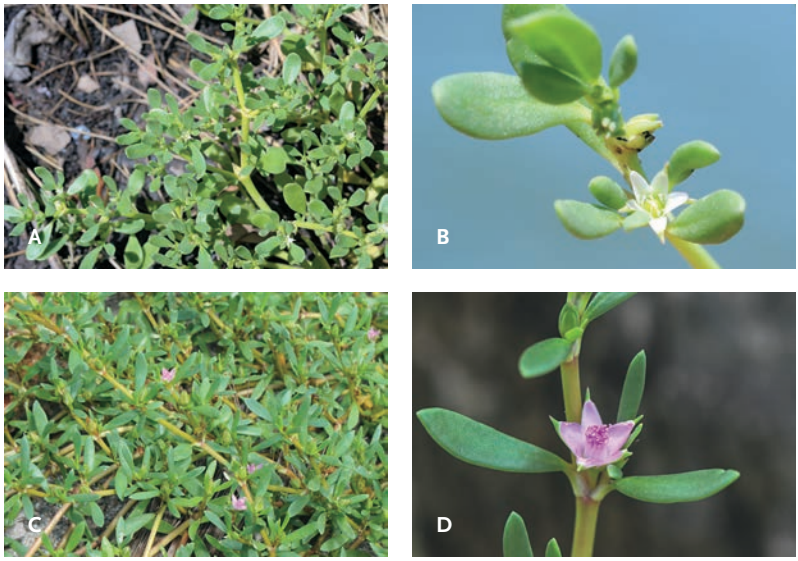
Sassafras is one of the best-known shrubs in the Carolinas, famous as the source of sassafras tea, which is derived from the bark of the roots. During colonial times sassafras was a major export from Virginia because it was in high demand in Europe for treating fever and venereal diseases. Closer to home, the emerging leaves were collected, dried, and ground for a spice—a use learned from Native Americans. The spice came to be called gumbo filé and is used in traditional Cajun cooking.

Because it contains high concentrations of safrole, a substance that is a weak carcinogen, sassafras bark is no longer sold in the spring as it once was. But the leaves contain insignificant amounts of safrole and can be safely harvested. Collect the leaves just as they emerge in early spring and dry them overnight. The dried leaves can be stored frozen to preserve their potency and then crushed or ground before use.

A Sea blite in a salt marsh. **B** A flowering branch of sea blite.

Sea Blite *Suaeda linearis*

"Blite" is an old English word for these and related plants. Like other halophytes (salt-loving plants) such as glasswort, sea blite can be eaten raw, cooked, or pickled, but it's especially good as a steamed vegetable. In the Carolinas, it is restricted to brackish sites along the coast. The leaves and stems of this annual are succulent and have a pleasant salty flavor. Harvest the upper portion of the plant—the stems, leaves, and flowers are all edible—before fruits begin to develop and the stems get woody.



A A small sea purslane plant with developing fruits. **B** A small sea purslane flower. **C** A large sea purslane plant. **D** A large sea purslane flower.

Sea Purslanes

Large Sea Purslane *Sesuvium portulacastrum*

Small Sea Purslane *Sesuvium maritimum*

As its common name implies, sea purslane is found on beaches and in saline areas, and it often forms large patches where little else grows. The entire plant of both species is edible raw and steamed. Just be sure to clip the plants rather than pull them up to avoid the adhering sand

and resultant dental damage. Older stems may be woody, especially on small sea purslane, and should be avoided.

Both species have opposite, succulent leaves. Small sea purslane is widespread along the coasts of both North and South Carolina and has white-to-pinkish flowers. It often grows with glassworts and other halophytes. Large sea purslane, on the other hand, is more common in South Carolina, has pink flowers, and can grow on the foredunes of beaches. It's found on the Pacific Coast as well. Another species, verrucose sea purslane (*Sesuvium verrucosum*), was an important food source for the Paiute people in Utah near inland saline wetlands.

A Virginia bluebells in early spring, before the forest canopy develops. **B** The shape of the Virginia bluebell flower resembles a hookah or water pipe.

Virginia Bluebell *Mertensia virginica*

Most common in the mountains, the Virginia bluebell is one of the guild of spring ephemerals—denizens of rich mountainous deciduous forests that flower before the overstory tree leaves mature. Bluebell leaves are simple and form a rosette from which the flower stalks arise with their delicate blue—or occasionally pink—flowers.

These leaves are one of the most desirable greens of the deciduous forest because they are firm and lack hairs. We consider it one of the best-tasting greens when boiled, with a mild, chard-like flavor. Bluebell leaves also dehydrate well.

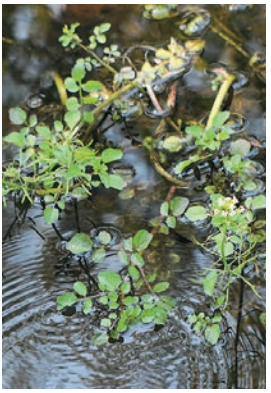
A Virginia waterleaf leaves at the right stage for harvest.
B Virginia waterleaf flowers.

Virginia Waterleaf *Hydrophyllum virginianum*

Virginia waterleaf is one of our favorites of the spring ephemerals. It grows in rich deciduous woods and produces white-to-pink flowers in midspring. It is most abundant in the mountains.

Waterleaf is a perennial with deeply dissected leaves that often have white splotches on them that look like water spots—hence the common name. Collect the leaves before the plants flower. They are best eaten steamed and have a pleasant spinach-like taste. They also dehydrate well.

Other species in the genus are, like Virginia waterleaf, most common in the mountains and can be harvested and eaten the same way.



Watercress is a true aquatic plant that's often found growing in standing water.

Watercress *Nasturtium officinale*

This Eurasian species was undoubtedly introduced to North America as a crop, but it's now spread throughout the Carolinas, where it grows wild in seeps, springs, and the margins of small streams. A true aquatic, it flowers in late spring. Its flowers are white, with four petals in a cruciform pattern, characteristic of the mustard family. In fact, it is its "mustardness" that makes watercress a culinary plant, with the desirable sharp flavor common to the mustard family. It's best eaten fresh, so make certain not to harvest it from polluted waters.

Water Hemps

Salt Marsh Water Hemp *Amaranthus cannabinus*

Southern Water Hemp *Amaranthus australis*

No relation to true hemp (*Cannabis sativa*), this annual, a relative of the commercial seed amaranth (*Amaranthus hypochondriacus*), is remarkable because of its large size—it can grow up to seven feet tall—and has a very thick stem. The leaves of some species in the genus, such as Joseph's coat (*Amaranthus tricolor*), are so nutritious that they are widely recommended to African smallholder farmers. We do not know the nutrition values for wild salt marsh water hemp and southern water hemp, but we assume they are similar to the profiles for cultivated species.

A vegetal behemoth of tidal rivers, southern water hemp has alternate simple leaves that can be large and quite succulent, as well as

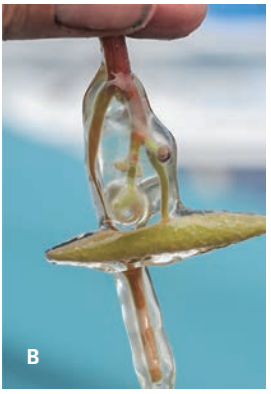
A Southern water hemp growing along a tidal river. This staminate (male) plant is seven feet tall. **B** Southern water hemp leaves at the best stage for collecting. **C** A pistillate (female) salt marsh water hemp plant.

small, unisexual flowers. Its robust size provides an abundance of healthy food in one gathering. While nutritious and easy to gather, southern water hemp leaves can vary greatly in bitterness from plant to plant, so nibble a leaf before harvesting a bushel. This species is more southern in its distribution, restricted to coastal regions in southern North Carolina and South Carolina. It is best used as a potherb.

Less impressive in size but more widespread is salt marsh water hemp. It is restricted, as its common name implies, to tidal marshes. Its leaves are narrower than those of southern water hemp, but the overall shape and use is similar. Like southern water hemp, it's best as a potherb, and the seeds of both species are edible.

Watershield *Brasenia schreberi*

The common name of this widespread aquatic plant refers to the structure of the leaf: the leaf stalk is attached to the middle of the leaf blade rather than the base, giving the leaf a shield-like appearance. Even more distinctive is the remarkable covering of clear slime that covers the shoots and young leaves. Disgusting? Au contraire. Watershield is



A Floating leaves of watershield.
B The shoots and developing leaves of watershield, covered with slime.

a sought-after delicacy in parts of the Far East, where it is steamed and eaten as a vegetable or dried and added to soups and sauces. It can be harvested any time during the growing season, but it's best when collected in the spring, when the leaves are most tender. Don't eat it raw unless you know the quality of the water in which it was growing. Boiling does not destroy the slime, nor does drying. The slime-covered stems and leaves can be dehydrated at 95°F for eight hours. The taste of the dried material is bland, but it can be used to thicken soup.

A tall wild lettuce plant just beginning to flower. Wild lettuce leaves can be collected at this stage, but they are better when younger.

Wild Lettuce *Lactuca canadensis*

Wild lettuce is a widespread edible found in a variety of habitats. Its leaves are arranged in an alternate pattern, and the lower leaves are usually deeply incised. The entire plant has a milky latex.

Harvest wild lettuce before the bright-yellow flowers appear. When

the plant is in early bud, the tender stem tips and buds can be eaten. One large plant can feed a group. All species of lettuce, including garden lettuce (*Lactuca sativa*), have a bitter component that is tasty in smaller amounts. Wild species, however, can vary greatly in bitterness. At least one of the populations we sampled was good raw and would do well in a salad. Taste a leaf before you decide how to eat it. If the plant is unpleasantly bitter, boil it and discard the water, then replace the water and boil once more, then eat it as a cooked vegetable.

The white blotches on these yellow passionflower leaves are diagnostic and readily separate this plant from the very similar melonette.

Yellow Passionflower *Passiflora lutea*

A perennial that produces climbing herbaceous stems every year, yellow passionflower is frequently found as a weed in suburban gardens and waste places. It is most common in the Piedmont and Coastal Plain and can form high climbing masses at the edges of maritime forests. The small yellow flowers are produced throughout the summer and are much less showy than flowers of its ostentatious relative the purple passionflower (see the chapter on nuts, seeds, grains, and fruits).

Unlike its cousin's, the fruits of yellow passionflower have a disagreeable taste. The young shoots can be eaten raw or steamed.

Flowers

Edible plant parts like tubers and leaves are fairly quotidian in their use. Flowers, on the other hand, add an exotic touch to a meal in a salad or as a garnish. For example, many restaurants serve orchid or violet flowers, pairing them with food in "edible bouquets." The reason foragers don't tend to seek flowers is that they have relatively little nutritive value. But they do have visual appeal, so here are a few guidelines to using edible flowers.

First, do not assume that a plant with edible flowers has other edible parts. For example, jewelweeds have edible flowers but mildly toxic stems and leaves. Second, do not wash the flowers before eating: this removes the nectar flavoring the flower. Third, always shake flowers vigorously to remove any insects that crawled inside seeking the nectar. Fourth, remember that flowers need to be eaten fresh and soon after harvesting. And finally, eat most flowers raw: cooking them usually yields an unappealing, anemic blob (though for some flowers in this chapter, a few cooking methods, like frying, are noted).

Black Locust *Robinia pseudoacacia*

Black locust is common throughout much of the Carolinas, usually at the margins of forests and along roads. Masses of white flowers fill the trees in early spring. The flowers have the typical "butterfly" structure of a legume, with a large banner petal pointing upward, two smaller wing petals on the sides, and a folded keel petal enclosing the stamens and pistil. With its alternate divided leaves, which have prickles at their base, black locust cannot be easily confused with any other tree.

As with many other flowers, be certain you thoroughly shake black

A A black locust tree in early spring. **B** These black locust flowers are typical of legumes with their butterfly-like structure.

locust flowers before eating to evict floral visitors. In Italy, battered and lightly fried black locust flowers are served as a dessert. Fresh flowers can be used to flavor plain yogurt (full-fat yogurt is best): mix fifteen flowers (sans leaves or stems) into a quart of yogurt and keep it in the refrigerator for two days before eating.

Cattails

Common Cattail *Typha latifolia*

Narrowleaf Cattail *Typha angustifolia*

Southern Cattail *Typha domingensis*

Cattails (species of genus *Typha*) are the best-known of any marsh plants, recognizable any time of year and found in wetlands everywhere. They're easy to identify and look similar around the globe, which is why cattails are often recommended as emergency survival food. In addition, all parts of the cattail are edible in at least some stage of their growth. The brown cattails of autumn, with cottony masses of seeds (technically fruits), are iconic—but the flowers are little known by the general public.

In mid to late spring, the flowering stem will appear with the developing male (staminate) flowers above the female (pistillate) flowers. Each inflorescence bears thousands of flowers. When bands of yellow begin to show in the male inflorescences, the flowers are ready to be harvested.

The male stalks are best used for their pollen, which is edible. To harvest the pollen, first cut off the male stalks and place them in a large paper bag (it must be a paper bag to prevent mold). Leave the bag

A The cattail in the foreground is ready for harvest of both the male and female flowers. **B** The male flowering portion of a cattail, ready to be harvested. **C** Pollen being released from the male part of a cattail. The female portion of the stalk—the lower green section—is also ready for harvest.

in a cool, dry place for a week, then shake the bag (closed!) to remove the pollen. Fifty stalks will yield about three cups of pollen, including the inextricable debris, which is impossible to completely remove even after careful sieving with a tea strainer (fortunately, the debris is harmless). The pollen can be stored for several weeks in the refrigerator. It also freezes well.

Pollen can be used in several ways. A family recipe for pollen cakes was given to us when we were teaching in Iraq by a Marsh Arab. Simply form the pollen into fragile clumps, place them on cheesecloth, and steam as you would vegetables for one hour. The taste is pleasant and slightly sweet. Pollen also works well in bread: adding a half-cup of pollen (that's a lot of pollen) to a medium-size loaf adds a subtle sweetness as well as a yellow color.

The female inflorescence is also edible. After removing the male parts, cut the stalk with sturdy clippers about six inches below the female flowers. Using the stalk as a handle, roll the female inflores-

cence in a mixture of cornmeal, salt, and pepper. Lightly fry in a minimum amount oil for about two minutes on each side. Rotate the stalks as they fry to prevent burning. Then, again using the stalk as the handle, eat the flowers like a corn dog—except this is a cattail dog.

A large common elderberry shrub in full flower.

Common Elderberry *Sambucus canadensis*

Elderflowers, flowers from the elderberry shrub, are currently a popular flavoring in soft drinks and liqueurs. The abundant small black fruits have long been used to make jelly.

Elderberries are one of the most common shrubs in the Carolinas, growing in ditches and other moist areas and producing large (up to two feet wide) masses composed of small, fragrant flowers in the spring. Its leaves are opposite and compound, with several leaflets. Like elderberry stems and seeds, the leaves are toxic when ingested.

Collect the flowering heads just as flowers are opening and nectar production is at its peak. The flowers have copious amounts of nectar, which provides the flavor for many popular elderflower recipes. Shake the flowers vigorously when collecting—the flower heads are often loaded with foraging insects. A pleasant, effervescent, and mildly alcoholic drink can be made from the flower heads (see the chapter on cordials). A simpler, nonfermented version of this drink can be made by soaking two large flower heads in a quart of water overnight.

Common Yucca *Yucca filamentosa*

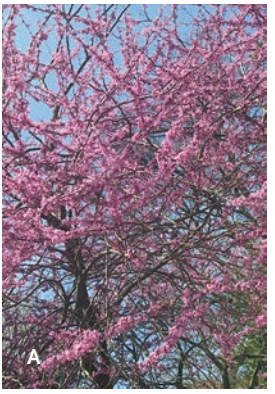
This native plant spread from its original range by frequently escaping from cultivation and is now found throughout the Carolinas in open, sunny, often disturbed areas. It is readily recognized by its stiff, spear-shaped leaves with curly filaments on the margins.

A Common yucca leaves. Note the diagnostic filaments arising from the leaf margins.
B Flowering stalks of common yucca.
C Floral buds of common yucca.

Several parts of the plant are edible. The young flowering shoots should be collected before any flowers open. Shoots can be boiled, but because they often contain tannins, they may require a second boiling to remove bitterness. The flowers usually lack the tannins and can be eaten fresh. They are well suited for salads, but cooking the flowers yields a soggy, unattractive lump.

The thick roots are full of starch (see the chapter on roots, tubers, and bulbs).

A second, uncommon species is found in the Coastal Plain of the Carolinas. Spanish dagger (*Yucca aloifolia*) resembles common yucca but lacks the stringy filaments along the leaf margins. The flowers are edible and can be eaten like common yucca flowers.



A The flowers of the eastern redbud appear before the leaves. **B** Flowers at this stage can be harvested.

Eastern Redbud *Cercis canadensis*

The eastern redbud is one of the most beloved harbingers of spring. This member of the bean family, native to the Carolinas, is a small tree with alternate heart-shaped leaves. It flowers around the same time as the dogwood (*Cornus florida*) and is common throughout the Carolinas. The pink flowers are edible and have a mild sweet flavor—they make an interesting topping for ice cream. As with all flowers intended for eating, vigorously shake the flowers to remove insects before eating.

A Flowers and buds of orange jewelweed. **B** Yellow jewelweed.

Jewelweeds

Orange Jewelweed *Impatiens capensis*

Yellow Jewelweed *Impatiens pallida*

These two species are called jewelweeds because when the leaves are submersed in water, the air trapped on the surface of the leaf gives it a silver sheen. Both species grow, often together, in similar habitats,

such as moist slopes in forests, the margins of streams, swamps, and other wetlands.

Jewelweeds are annual plants with succulent stems and attractive flowers, and their saponins—naturally occurring surfactants that are mildly toxic when ingested—provide an antidote to poison ivy. Fortunately, the flowers do not contain saponin, so they are edible. They have a pleasant crunch. Just be sure the crunch is from the flower, not an insect you made homeless.

A Swamp rose mallow in midsummer. **B** Halberd leaf rose mallow, also in midsummer. **C** Flower buds of swamp rose mallow at the right stage for collecting and drying. **D** The okra-like young fruits of swamp rose mallow.

Mallows

Halberd Leaf Rose Mallow *Hibiscus laevis*

Swamp Rose Mallow *Hibiscus moscheutos*

Mallows are widespread in the Carolinas and are closely related to a hallowed Carolina vegetable, okra (*Hibiscus esculentus*). The two most

abundant native species are the swamp rose mallow and halberd leaf rose mallow. Both mallows are wetland plants, but they are readily distinguished from each other by the shape of their leaves. Halberd leaf rose mallow leaves have two lobes at their base, and the flowers are pink. Swamp rose mallow leaves lack lobes, and the flowers are usually white but sometimes pink.

Mallow flowers are among the largest of any native wildflowers in the Carolinas and are edible in the bud stage, when they can be dried and then used to make tea. The young green fruits not only resemble okra but have a similar taste and even the requisite mucilage like okra when boiled.

Harvest the developing fruits when they are mere nubbins, no longer than one and a half inches long, and are easily sliced with a knife. They can be dehydrated at this stage.

A A roadside population of orange day lilies in full flower.
B Orange day lily floral buds. All stages of the buds are edible, but the intermediate sizes are the best for eating.

Orange Day Lily *Hemerocallis fulva*

Both the floral buds and the tubers of this widespread garden escapee can be eaten, but the buds are most widely consumed. Dried buds are sold in Asian markets and used in Chinese cooking. While the buds are edible at any stage, the most desirable ones are those that retain some green at both the tip and the base of the bud.

The fresh buds are tasty, with an appealing crunch. The flavor is mild and has a hint of umami. You can also dehydrate buds at 95°F for two days. Dried buds can be added to soups. Store dried buds in the freezer for a longer shelf life.

A purple passionflower plant in full flower.

Purple Passionflower *Passiflora incarnata*

Purple passionflower may be the Carolinas' most intricate flower, and it's certainly one of the most beautiful. It is a perennial that dies back to the ground in the winter, and it's most common in the Piedmont and Coastal Plain, where it occupies open, sunny, and usually disturbed areas.

The flowers can be eaten but are best used for their beauty. Placed in the center of a bowl of rice or other food, the blossoms make for a striking and edible presentation. The fruits are also edible and are widely known in the Carolinas as "maypops" (see the chapter on nuts, seeds, grains, and fruits).

A A dense stand of Queen Anne's lace. Note the finely divided leaves. **B** The central red flower is said to represent a drop of Queen Anne's blood that fell when she pricked her finger while making lace.

Queen Anne's Lace *Daucus carota*

Arguably one of the best-known species of the weed flora, Queen Anne's lace is a form of the cultivated carrot that has now gone wild and become well adapted to its new habitat. It is unique in having a

tiny red flower (or a small group of flowers) in the center of the hundreds of white flowers of the flowering head.

The foliage retains the characteristic smell of carrots but should not be ingested because of reported mild toxins and possible phyto-photosensitization (an inflammatory reaction caused when sunlight interacts with chemicals in the plant that have been ingested or are on the skin). The flower heads, however, can be used to prepare a simple, refreshing summer drink: just place four heads in two cups of water and let them steep for two days. It's best when chilled. Be certain to thoroughly shake the flower heads before steeping to dislodge the numerous insects that might be usurping your flavoring.

A The flowers of swamp rose are colorful and fragrant. **B** The fruits (rose hips) of the swamp rose can be used for making tea but should be carefully strained out and not ingested.

Swamp Rose *Rosa palustris*

Swamp rose is widespread and, as the common name implies, is found in wet areas in freshwater marshes and along streams. The Carolina rose (*Rosa carolina*) is likewise common but is found in drier habitats. Both species have pink flowers with five petals, alternate leaves, and stems armed with prickles, and both can be used in the same manner.

The petals can be collected just after the flower opens and made into a jam or dried to make tea. Caution! The seeds found in the rose hips, the fruit of the rose, contain stiff hairs that can irritate the digestive tract. To avoid harm, do not ingest fresh hips. If you're making rosehip tea from dried fruits, strain the hot tea through a tea strainer.

A The long-spurred violet, chiefly a mountain species. **B** The downy yellow violet, which is found mainly in the mountains and the Piedmont. **C** The Canada violet is widespread in the mountains and the Piedmont.

Violets

Canada Violet *Viola canadensis*

Downy Yellow Violet *Viola pubescens*

Long-Spurred Violet *Viola rostrata*

These three species are all from a large genus, *Viola*, the violets. The Carolinas are home to about thirty species of violets, all of which are edible. The flowers may be blue, purple, yellow, or white and often can be sustainably harvested in large numbers.

Violet flowers have one of the most distinct flavors of any of our native plants. The intensity of the flavor varies among species. Like their relative the pansy (*Viola tricolor*), violets are often used decoratively in food presentations. They're also used fresh as a flavoring in vodka, mixed into ice cream, and baked into cookies and cakes.

A Wild bergamot is a hearty perennial often planted in gardens.
B Bergamot flowers are borne in dense heads.

Wild Bergamot *Monarda fistulosa*

Wild bergamot is widespread in the Carolinas, especially in dry, sunny habitats in the mountains and the Piedmont. The plants emit a strong scent, especially on hot summer days when they are in full flower. Fresh wild bergamot flowers add a pleasant flavor to pork and beef dishes, but use sparingly. They can also be dried to make an herbal tea.

A Wild columbine leaves have a fernlike appearance. **B** A single wild columbine flower. Note the knob-shaped nectaries at the tip.

Wild Columbine *Aquilegia canadensis*

Wild columbine has one of the most distinctive flowers of any plant—and one of the sweetest. The knob-like structures on the tips of the sepals are filled with a sweet nectar. Columbine is widespread in the Carolinas, though it's more abundant in the mountains and Piedmont, often flowering in the spring in open woods and rocky outcrops. It is popular in gardens because it is a perennial and grows readily from seed. The flowers add color and a sweet nectar to a salad.

A Wild fennel at the peak of flowering. This plant is seven feet tall. **B** A flowering head of wild fennel showing the tiny yellow flowers that are the main component of fennel "pollen." **C** Fennel "pollen" after drying.

Wild Fennel *Foeniculum vulgare*

An occasional but vigorous escapee from cultivation found at scattered localities in the Carolinas, wild fennel can grow up to ten feet tall from thick rhizomes. While it is the weedy expression of a crop, it can become noxious and require control in heavy infestations. Its leaves are alternate and finely dissected, with leaf bases that wrap around the stem. Though all parts of the plant are edible, the weedy wild fennel usually does not produce the bulbous bases that are relished as a vegetable.

A current food fad is fennel "pollen," which includes small amounts of pollen but is mainly buds of the tiny flowers. It is used as a dry rub on chicken and pork. The flavor is distinct but mild. Store the pollen in the refrigerator. The potency of the spice diminishes faster at room temperature.

Collect the flower heads before the seeds (technically fruits) are produced and dry them in a paper bag at room temperature for three days. After three days, vigorously shake the bag or crush the dried heads in your hands. This will yield, in addition to the flowers, fragments of the plant that are also edible. Strain the mixture through a tea strainer or small sieve to remove larger pieces. Store it in the refrigerator.

Nuts, Seeds, Grains, and Fruits

This heterogeneous group of edibles includes nuts, seeds, grains, and fruits—all in the culinary sense rather than the technical botanical sense. Most of these are hard and can be stored dry for some time, and they are typically nutritious. Fruits are the best-known product of wild plants and are usually a major component of guides to edible plants, and for that reason we have included only a few: we have tried to emphasize plants and uses less well known to the wild food forager.

Nuts

Botanically, nuts are fruits with a single seed and a very hard fruit wall. They were widely used by Native Americans in the pre-Columbian days, but many of the nuts described here are little known as a food source today.

Allegheny Chinquapin *Castanea pumila*

Found throughout the Carolinas, usually in open areas on poor soil, chinquapin is a delicious and underutilized nut. Perhaps it is the armament of the husks that deters collecting. The shiny brown nuts, about the size of an olive, are borne in prickly clusters on the shrub in late summer and early fall. Chinquapins usually have multiple trunks up to ten feet tall; the unisexual flowers are produced in the spring.

The Allegheny chinquapin is a close relative of the ill-fated native American chestnut (*Castanea dentata*), which was nearly wiped out by a blight in the last century. Fortunately, chinquapin is not severely affected by the blight.

A An Allegheny chinquapin plant in fruit. **B** Chinquapin nuts removed from the husk, nuts cracked from heating, and nutmeats with the shells removed.

Wearing thick gloves to guard your hands against the nuts' protective prickles, harvest the entire cluster of fruits when you see one or two husks in the cluster open, exposing the nut. Put the fruits in a paper bag in a dry place and most of the other fruits will open. If you wait too long, the fruits will fall, making them difficult to collect, or they'll be harvested by animals.

The nuts are more flavorful raw than cooked. Use hedge clippers to cut the nuts in half and remove the nutmeat with the tip of a knife. If you want to roast the nuts, first nick the shells several times with sturdy kitchen scissors—if they aren't punctured, they could explode during roasting.

It's best to roast the nuts in an oven at 425°F. Remove them from the oven immediately as soon as they change color. It is very easy to burn them. Roasting will cause the nut to split, making it easy to peel off the shell. As soon as the nut splits, immediately remove it from the oven. It is very easy to overroast, causing the nutmeat to harden and lose flavor. And just in case you didn't fully cut or puncture the shells before roasting, close the oven door so if the nuts do explode, they won't shoot hot fragments in your face. Unlike the well-known Yule song, you want these nuts roasting in a *closed* fire.

Like most Americans, we have not eaten any American chestnuts, but the flavor of the chinquapin is certainly as good as that of the classic European chestnut (*Castanea sativa*), which is sold freshly roasted by street vendors in Mediterranean countries around Christmas.

A A large American lotus population with flowers and fruits. **B** The stages of fruit production for an American lotus. Each fruiting head contains about two dozen single-seeded fruits. **C** Mature American lotus nuts, cracked in order to harvest the starchy nutmeat. Flour made from the nuts is shown at lower left. **D** A sacred lotus plant (*Nelumbo nucifera*).

American Lotus *Nelumbo lutea*

The American lotus is the empress of aquatic plants, with beautiful yellow flowers as large as a dinner plate. It is not a common plant, though it often forms dense populations, and the forager who finds it in one of the dozen or so counties of the Coastal Plain is fortunate.

All parts of the plant are reported to be edible, and from personal experience we can recommend the fruits, which are technically nuts. They are delicious fresh, with a hazelnut flavor. For raw consumption they need to be harvested before the fruit coat hardens and becomes hard to crack—but if you plan to store the nuts for future use, it's ideal to collect them at this hardened stage, as Native Americans did. The mature nuts shown above were collected more than twenty-five years ago. Nuts of the related sacred lotus have germinated after being stored for more than a thousand years!

To extract the starch, crack the nuts and remove the chunks of white starch with a nail or other pointed instrument. The pieces can

then be ground with a mortar and pestle or a spice grinder. The flour has a nutlike flavor and is good when added to bread flour for baking.

The related sacred lotus escapes from cultivation on rare occasions and may occasionally be found growing wild. It is likewise edible, and the underground tubers are used in Chinese cooking. The stems are decorative but forgettable in taste.

A A shagbark hickory tree showing the distinctive strips of bark. **B** Mature hickory nuts—mockernut hickory at top, shagbark hickory below. **C** Smashed nuts of both hickory species, including shell fragments and nutmeat. **D** A kunuche ball. **E** Kunuche suspended in water.

Hickory Nuts

Mockernut Hickory *Carya tomentosa*

Shagbark Hickory *Carya ovata*

Hickories (genus *Carya*), which belong to the walnut family, comprise the second-largest genus of trees in the Carolinas (first are the oaks).

They are all forest trees with edible nuts, but some are so bitter as to be unpalatable, like those of the water hickory (*Carya aquatica*), common in coastal wetlands. Shagbark hickory on the other hand, is delicious and abundant in the Piedmont and scattered elsewhere. Mockernut hickory, also delicious, is widespread throughout the Carolinas.

Hickories were a major food item for several Native American peoples, and it is postulated that hickory trees may be abundant in some areas because they were protected as food sources. One traditional recipe that uses hickory nuts is kunuche, which was used by the Cherokee as a cooking stock and condiment. Other nations have very similar recipes. We have used both mockernut and shagbark hickories to make kunuche, and no doubt other species could be used as well.

Extricating the oil-rich hickory nutmeat from its thick, convoluted, woody shell is tedious and leaves much of the meat in the shell. Making kunuche is a way to maximize the use of the nuts. After harvesting the nuts in the fall, dry them for a few days. This allows the meat to separate from the woody walls of the shell. Crack the nuts and discard those with insect larvae or aborted seeds, as well as any large shell fragments lacking nutmeat. Smash the healthy nuts with a sledgehammer or large rock until the pieces are small enough to pass through a colander. Transfer the nut pieces to a mortar, pot, or other container and grind with a pestle until you get a rough paste that will hold its shape when pressed into a two-inch ball. Store these balls in the freezer until you're ready to cook.

To prepare kunuche, crumble a two-inch ball into a quart of boiling water, then turn the heat down to low and simmer for about 15 minutes. Pour the mixture through a fine-mesh strainer into a pot. The rich, oily, slightly sweet liquid makes an excellent soup stock. We like to add cooked hominy. The strained solids can be reboiled for a second (though more watery) batch of stock.

Like many other nuts, hickory nuts are full of oil and will become rancid at room temperature. We have refrigerated fresh kunuche for several months and the flavor was unaffected.

A Developing fruits on a hop hornbeam tree in midsummer. **B** The small yellow nuts of the hop hornbeam at the right stage for harvesting.

Hop Hornbeam *Ostrya virginiana*

The common name of this tree refers to the fruit clusters, which bear an amazing resemblance to the fruits of the unrelated hop plant (*Humulus lupulus*). "Hornbeam" refers to the tree's very hard wood. Hop hornbeam is widely distributed in the Carolinas but is most abundant in the mountains.

Hop hornbeam nuts are small and contained in the saclike structures of the fruit. They make a good snack, with the flavor of a peanut and the texture of a peanut shell. Harvesting these seeds is fiddly, however, and results in little food. We have not tried roasting the nuts.

Longleaf Pine *Pinus palustris*

This iconic tree of the Coastal Plain of both Carolinas once formed vast, open woodlands that were home to some of the most diverse flora on the continent. Longleaf pines were the source of resins, pitch, and tar for the extensive naval stores industry—hence the term "tarheel." The tree's significance in the region is enshrined in the official toast of North Carolina, which declares, "Here's to the land of the longleaf pine . . . Here's to 'Down Home,' the Old North State."

Like those of all pines, the seeds of the longleaf are edible, but this is the only pine in the Carolinas' flora with seeds—known as pine nuts—large enough to be worth harvesting. Longleaf pine nuts are tasty and oil-rich seeds, and their flavor is like that of the commercially available pinyon pine nut, though more pleasantly resinous. Another feature of longleaf pine is that seeds are produced in the winter. Seed production can last for about a month. Yearly seed production is erratic, with large numbers only in some years—years when enough

A A stand of longleaf pines. **B** Longleaf pine seeds with wings. The white seeds have the wing and the seed coat removed. **C** A longleaf pine cone with freshly germinated seeds.

seeds are produced to satiate grazers, allowing germination of a portion of the crop.

Begin the tedious preparation of pine nuts by removing the wing, which transports the seed to a suitable site for growth, then crack the seed coat to expose the seed. Take care not to smash the seed itself. Refrigerate the seeds to prevent their oils from becoming rancid. Seeds can be roasted, but they burn easily because of the oils.

Oak Genus *Quercus*

Acorns are one of the most nutritious of any of the edible wild plants of the Carolinas, and because oaks are ubiquitous, they're the most available. They are also one of the most tedious nuts to prepare, which may be the reason they are often not emphasized in wild plant courses or used by many foragers. Acorns can also be extremely—gaggingly—bitter because of tannins.

The bitterness varies considerably between the two major groups of oaks, white oaks and red oaks: the acorns of red oaks are typically much more bitter than those of white oaks. Knowing the difference be-

A Leaves of a white oak. **B** White oak acorns. **C** A white oak acorn cut in half. Note the white flesh and the presence of acorn weevils. **D** A bluejack oak tree (*Quercus incana*). **E** Bluejack acorns.

tween these two groups can save time and effort when selecting acorns for eating. The two groups can be distinguished by their leaves, upper bark, time required for acorn maturation, and other subtle differences. The scales that make up the cap of the acorn are flat in red oaks and rough in the white oaks. Overall, the acorns of red oaks are smaller than those of white oaks, and they usually have an orange flesh.

The acorns from some populations of white oaks can be eaten fresh, especially those of the southern live oak (*Quercus virginiana*), but others should be boiled to reduce the bitterness. Harvest acorns as soon as they ripen and cut each acorn in half crosswise with pruning shears. The halves of the seed can then be removed with a nail or other sharp object. Check for grubs and discard any with acorn weevils. Next, chop the acorns and boil them in a large volume of water. Taste the acorns. If they're still bitter, replace the water and boil them again—and, if necessary, again and again.

There are many recipes for using acorns in bread and gruel, and they're featured in the Korean specialty mok (Musselman and Wiggins 2013). Acorns are surprisingly nutritious and were a major source of sustenance for people in the temperate regions of the world for millennia. They deserve more consideration by foragers.

Seeds

Curly Dock *Rumex crispus*

Curly dock is a widespread weed found in open sunny areas like roadsides and margins of fields found in almost every county of the Carolinas. The young leaves are edible (see the chapter on shoots and leaves).

The fruits of this relative of buckwheat (*Fagopyrum esculentum*), which look like seeds, are easy to strip from the plants when they are brown and dry. The seeds are nutritious but tedious to clean. One

A Curly dock in flower in early spring. **B** Large numbers of curly dock's three-sided fruits are produced in midsummer. **C** Curly dock seeds (left) and fruits (right).

way to clean the seeds is to wear rubber gloves and vigorously rub the fruits to break off the winged covering. This process can be slightly expedited by putting the dry fruits in a coffee grinder at high speed for two minutes. Take care not to break the seeds; if the seeds break, you'll see white fragments. Rub the fruits again while wearing gloves, then place them in a bowl of water. Many of the seeds will sink and the chaff will float. However, it is virtually impossible to remove a lot of the chaff. The chaff is fibrous but edible. The taste of the seeds is pleasant, similar to buckwheat.

A A stand of pickerel weed with developing fruits bending toward the water. **B** A flowering stem of pickerel weed. **C** A foraging student harvesting pickerel weed fruits. **D** At left, mature fruiting stalks of pickerel weed; top right, fruits; and bottom right, white seeds.

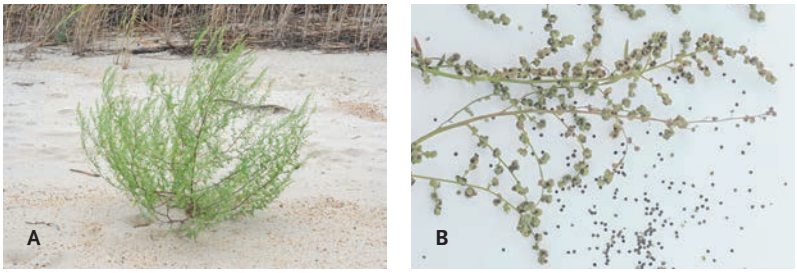
Pickerel Weed *Pontederia cordata*

Pickerel weed is one of the most widespread aquatic plants in the eastern United States. It is abundant in the Carolinas, particularly in coastal areas and along streams, lakes, marshes, ditches, and other aquatic habitats. The bright-purple flowers are abundant throughout

the growing season. The flowers are upright, but when the fruits begin to develop, the fruiting stalk (infructescence) bends to submerge the fruits in the water. Some other water plants, such as the white water lily (*Nymphaea odorata*) and watershield (*Brasenia schreberi*), also mature their fruits underwater.

Pickerel weed seeds are ready for harvest when the fruits separate from the stalk. Collect the fruiting stalks and place them in a container immediately after collecting—the fruits begin to drop after harvest. Each fruit is three-sided, has prominent ridges, and contains a single seed about the size of a grain of rice. When you wash the ripe fruits, the seeds will float and can be skimmed off. Drying the fruits is another way to obtain a usable quantity of seeds. Place the dried fruits on a cloth towel and rub them with the palm of your hand. Put the seeds and broken fruits in water to obtain the seeds, which will sink.

Pickerel weed seeds are tasty, with a slight nuttiness. For the wild-food enthusiast, the ability to easily collect large numbers of fruits compensates for the tediousness of obtaining seeds.



A A bushy habit of pit seed goosefoot at the edge of a salt marsh.
B Fruiting branches and seeds of pit seed goosefoot.

Pit Seed Goosefoot *Chenopodium berlandieri*

This species was one of the chief crops of what anthropologists call the Eastern Agricultural Complex (EAC), a group of native plants that were cultivated by Native Americans in the Woodland period, 1000 BCE to 1000 CE. Unlike sumpweed (*Iva annua*), another important crop in the EAC, today's pit seed goosefoot populations produce the same size seeds as the pit seed goosefoot grown by Native Americans. Quinoa (*Chenopodium quinoa*), a close relative, is now a popular food.

Pit seed goosefoot is not common in the Carolinas, where it is restricted to the Coastal Plain and favors the margins of salt marshes;

it's found in naturally and artificially disturbed areas. For the forager, this shrubby plant's scarcity is partly compensated by its size: it's often three feet across and four feet tall, so it's easy to spot and a single plant provides an abundance of seed.

The seeds are tiny, the smallest of any in this book, but rich in protein and minerals. Their taste is somewhat nutty when raw. Examination of paleofeces (fossilized feces) shows that when early humans processed the seeds, they retained much of the chaff, which was also ingested.

Harvest the plants in midautumn, when the tiny black seeds (half the size of quinoa) are produced. Cut the branches so they fit into a paper bag and leave them in a bag to dry for a week, after which they can be cleaned. Shake the bag to gently thresh the seeds, then put the seeds and chaff in a bowl of water. Most of the seeds will sink. Unlike common goosefoot seeds, pit seed goosefoot seeds are not lustrous because there are minute pits on the seed's surface.

A Leaves of silver maple. Note their distinct lobing.
B Winged fruits of silver maple and seeds with the wings removed.

Silver Maple *Acer saccharinum*

Silver maple is most common in the mountains of the Carolinas and also is found along some coastal rivers. It's also frequently planted as a street tree. Like all maples, it has opposite leaves; silver maple leaves are distinguishable from others by their five lobes and silvery undersides. All maple seeds are edible, but only the silver maple has seeds large enough to warrant gathering.

Silver maple trees flower in the early spring, yielding the well-known winged fruits that delight children as they twirl to the ground. The wings often land with the sharp tip in the soil, giving the seed a

head start when germinating. They can be collected in large numbers after landing on sidewalks and driveways.

The seeds are edible raw or sautéed in a little olive oil. When raw, they taste like edamame. Sautéed, they have a peanut-like flavor.

A Mature spurge nettle fruit ready to open.
B Spurge nettle seeds and fragments of the ovary wall.

Spurge Nettle *Cnidoscolus stimulosus*

Widespread in the sandy, open woods of the Coastal Plain, spurge nettle is initially unappealing as an edible because of its stinging hairs and its kinship with well-known toxic plants like castor (*Ricinus communis*), the source of the deadly compound ricin. Yet spurge nettle produces both edible leaves (see the chapter on shoots and leaves) and seeds.

Harvest when the maturing fruit begins to split, revealing a white panel. Use gloves to pick the fruits and put them in a paper bag. Latex or leather gloves work better than cotton, which can be pierced by the sharp hairs. Secure the bag shut; the fruits will explode as they dry and drop their seeds.

Although small, the seeds are tasty whether fresh or roasted. It is easy to burn the seeds when roasting because of their oils. Both fresh and roasted seeds taste like peanuts.

A Flowering sumpweed stems.
B Sumpweed fruits (at left) and seeds (at right).

Sumpweed *Iva annua*

The common name "sumpweed" is confusing. It is actually an uncommon name bestowed by association: it was falsely assumed that this species, like the better-known marsh elder (*Iva frutescens*), is a plant of "sumps," an Old English word for "swamp" or "marsh." The USDA online plants database (plants.usda.gov) goes even further astray by giving this plant the common name "annual marsh elder"!

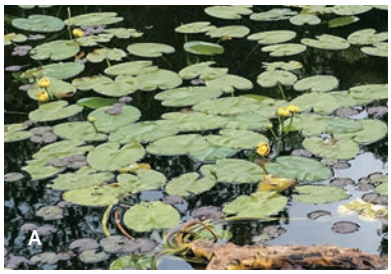
True, *Iva annua* is a plant of moist areas, but it is not a wetland plant. Rather, it occurs in weedy areas, like other species that were introduced as crops.

As the word "annua" in the scientific name suggests, sumpweed (the name is used here under protest) is an annual. Species related to it in the Carolinas are the widespread marsh elder and the sand dune species seacoast marsh elder (*Iva imbricata*); both are perennial shrubs.

Sumpweed was an important crop in pre-Columbian Native American cities such as Cahokia, and it deserves increased attention by wild food foragers. It is part of a guild of plants that are now widely distributed and were once important food sources for Native Americans.

Whether sumpweed is native to the Southeast is questioned, as its proclivity for disturbed and weedy areas is common in introduced species. The variety grown as a crop—known as *Iva annua* var. *macrocarpa*—has fruits twice the size of the wild variety. This large-seeded variety is apparently now unknown in nature.

The seeds are very nutritious and pleasantly bland when boiled, and they have a difficult-to-describe tang as a finish.



A Yellow water lilies at the edge of a small lake in about six feet of water. **B** Mature yellow water lily fruits (exceptionally dark in this collection). Note how seeds are arranged in packets. **C** Mature yellow water lily seeds.

Yellow Water Lily *Nuphar advena*

This widespread water lily has numerous common names and a diversity of taxonomic synonyms. It is most frequently found in the Piedmont and Coastal Plain of the Carolinas, and it flowers and fruits for the entire growing season. It is easily recognized by its yellow—and occasionally red-tinged—flowers, which mature into a many-seeded fruit (technically a berry). At maturity the fruits in some populations smell like brandy (but lack a brandy taste), providing the source of one common name, "brandy bottles."

The seeds are hard and about the size of a popcorn kernel. They can be popped like popcorn in a toaster oven set at medium. The taste resembles roasted barley.

Grains

On a worldwide scale, more societies are dependent upon grains—technically the fruits of grasses—than upon any other group of plants. Billions of people get their daily calories from rice, wheat, corn, barley, and lesser-known grains like teff, sorghum, and millet.

The grass family is one of the largest families in the Carolina flora, with hundreds of species, yet few of its species are used by foragers. This sec-

tion gives some examples to encourage more attention to food from native grains. Also, for botany students, experiencing the arduous work of obtaining enough grain from a wild grass for a meal improves their understanding of the evolution and selection of crops.

Several grass genera native to the Carolinas have kin in other parts of the world that are used for food, and we have selected native species in those genera.

Bristle Grasses

A crop from a bristle grass used on a limited scale is foxtail millet (*Setaria italica*), an ancient food now grown mostly in East Asia. Several other species of bristle grasses are found in the Carolinas, and all are edible. They are distinguished by a flowering and fruiting head that bears a fanciful resemblance to a foxtail, which is another common name for these grasses.

A A fruiting stand of giant bristle grass. These plants are ten feet tall. **B** A fruiting head of giant bristle grass ready for harvest.

Giant Bristle Grass *Setaria magna*

A stand of this grass is spectacular, with flowering heads three feet long borne on stems ten or more feet tall. Giant bristle grass is restricted to coastal regions, where it can be abundant in interdunal swales and brackish marshes. While the size of the fruiting branches is huge compared to those of other bristle grasses, the size of the grains is the same, and threshing the tiny grains requires the same amount of labor. Follow the preparation instructions for knotroot bristle grass, below.

A A flowering head of knotroot bristle grass. **B** A mature fruiting head of knotroot bristle grass and separated grains. The black grains have had the chaff removed. **C** A dense stand of knotroot bristle grass with mature fruits.

Knotroot Bristle Grass *Setaria parviflora*

This perennial grass is found in most counties in the Carolinas, often in moist soil. The grains ripen in late summer.

Harvest when you see that some of the fruiting heads have some empty spaces where mature grains have fallen. Clip the heads (they are often difficult to break by hand) and store them in a paper bag for three days at room temperature, then strip the grains from the fruiting heads. The next step is the most frustrating: separating the tight enclosing structures—the chaff—from the grains. This can be accomplished by rubbing the grains between your palms. This will yield a remarkably small number of shiny black grains; these can be eaten raw or, if you have the patience to obtain a big yield, ground into flour. The grains can also be added to bread.

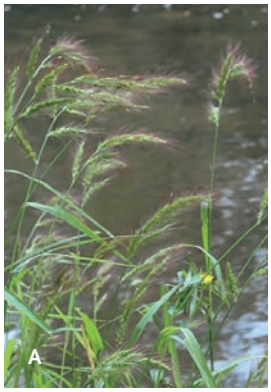
A Fruiting river oats plants along a river. **B** River oats grains are silhouetted in this fruiting branch. **C** River oats grains after threshing and cleaning.

River Oats *Chasmanthium latifolium*

River oats are often found in large populations along rivers and in wooded swamps throughout the Carolinas. They're also now widely planted as an ornamental grass.

The grains ripen in mid to late fall. Cut the fruiting stalks, place them in a large paper bag, and leave them in a cool, dry place for a week. After a week, thresh the grains by rubbing the fruiting branch between your hands. Unlike the other native grasses in this chapter, river oats are relatively easy to thresh. The majority of the chaff can be removed by traditional winnowing (tossing the grass and chaff into the air so a breeze removes lighter material).

The flavor? Pleasant, wheat-like. River oats make a flavorful addition to breads, or grind them and mix the flour fifty-fifty with semolina flour to make a tasty pasta.



A Swamp barnyard grass in flower.
B Mature grains of swamp barnyard grass.

Swamp Barnyard Grass *Echinochloa walteri*

This species of barnyard grass is restricted to coastal counties in the Carolinas, but other species are widespread and are similar in form and use.

An Asian relative, Japanese millet (*Echinochloa frumentacea*), is an important grain crop that will produce a suitable yield on marginal land. No nutritional information on swamp barnyard grass is readily available, but it likely shares beneficial features with its Asian relative.

Harvest the stalks in the fall. Place them in a large paper bag and leave them in a cool, dry place for a week to allow them to dry before threshing the grains: simply rub them between your hands to remove the chaff. Removing the chaff is a chore, but the grains are relatively large for a native grass. The traditional way of eating Japanese millet—and what we recommend for swamp barnyard grass—is as a gruel. The grains can also be ground and added to bread flour.

A A stand of switch cane. **B** Switch cane branches heavy with grains. **C** Switch cane before threshing grains. **D** Note the distinctive groove in these dried switch cane grains.

Switch Cane *Arundinaria tecta*

Switch cane, a bamboo species native to the Southeast, is found in moist areas throughout the Coastal Plain of the Carolinas, where it once formed extensive stands known as cane breaks. Giant cane (*Arundinaria gigantea*) and hill cane (*A. appalachiana*) are species of the Piedmont and the mountains.

Your chances of finding switch cane in fruit are akin to your chances of seeing the return of typewriters and rational political discourse. While some switch cane populations flower most years, fruiting is extremely rare. Most professional botanists have never seen this grass fruiting. We encountered it only once during a two-year period of fruiting. Once the fruits are produced, the entire plant dies. This behavior of one fruiting event followed by death is called "semelparity" and is characteristic of bamboos.

Immense quantities of switch cane grains can be collected in a short time simply by stripping the grains off the stems. The grains resemble barley in size and shape. It is hypothesized that the domes-

tication of wheat and barley was initiated by the harvest of the largest grains in the native flora of Mesopotamia. This is the largest grain in the Carolinas' flora, but the semelparous behavior of cane militates against domestication.

Fresh switch cane grains are chewy and slightly sweet. We have dried and ground grains to produce flour for bread. Because switch cane grains contain little if any gluten, the cane flour should be mixed with wheat flour for baking.

Fruits

Wild fruits call to mind blackberries, raspberries, blueberries, persimmons, and more—all easy to recognize and tasty to eat without any further preparation. We do not include these well-known wild edibles in this section (though some are included in the chapter on cordials). Rather, here we want to stress the unconventional.

Immature fruits of melonette suitable for harvest.

Melonette *Melothria pendula*

This humble, often-weedy native plant has a more illustrious relative, Mexican sour gherkin (*Melothria scabra*), which is grown as a curiosity vegetable and pickled. Melonette, also known as creeping cucumber, is most common in the Coastal Plain and Piedmont of both Carolinas.

The common name of this delightful diminutive fruit means "small melon," which is appropriate since its green fruits resemble tiny watermelons. In fact, melonette is in the same family as watermelons, the cucumber family.

The ripe fruits are dark purple and bitter when they mature in late summer or fall, but the immature fruits can be eaten raw and have a

flavor reminiscent of cucumber. The green fruits are ready in midsummer. They make crunchy pickles when preserved in a standard brine.

A Muscadine grapes at the right stage for making a powdered seasoning.
B The seasoning made from these grapes.

Muscadine Grape *Vitis rotundifolia* or *Muscadinia rotundifolia*

Muscadine grapes are native and widespread throughout the Carolinas. They are also grown commercially for the large, thick-skinned fruits. Most plants have purple fruits, but there is a cultivar with yellowish-green or bronze skins, known as the "scuppernong grape." Like all grapes, muscadines are lianas, high-climbing woody vines. Unlike other grapes, muscadines are not borne in typical grape clusters but rather as single fruits or groups of three or four.

Muscadine grapes are one of the most recognizable wild fruits, and we have harvested them to make grape jelly. However, they can also be used to make a flavoring that imparts a pleasant sour taste to meats and other dishes. This seasoning is popular in parts of the Middle East.

Harvest the grapes when they are still firm and green. Try to collect them before the seeds are hard. As the grapes mature, they will develop small dark spots on the skin. It's best to harvest before these appear.

To make the seasoning, first dehydrate the green grapes until they are hard and dry. This will take twelve hours with a dehydrator set at the fruit setting (105°F). Alternatively, the grapes can be dried in the sun after they have been cut in half.

With a food processor or coffee grinder, grind the dried grapes to a powder. This powder can be used as is or mixed with salt and cayenne

pepper to make a tasty seasoning. It is good on roasted chicken. One quart of fresh green grapes will yield about a cup of seasoning.

We have only used muscadine grapes to make this powder, but it seems likely that any native grapes could be used.

A maypop opened to show the pulp surrounding the seeds.

Maypops (the fruit of purple passionflower) growing on a fence.

Purple Passionflower *Passiflora incarnata*

Purple passionflower is found in almost every county in the Carolinas in old fields, roads, fencerows, and other disturbed areas. The flowers are one of the most striking in the Carolinas' flora (see the chapter on flowers), and the fruits are well-known nibbles called "maypops."

The edible part of the plant is the pulp surrounding the seeds and the lining of the fruit. It has a sour, citrusy flavor. One way to enjoy it is to scoop out the pulp and put it in boiling water to make an infusion. Five mature fruits in four cups of water makes a refreshing drink.

A Fruits of the white mulberry vary in color. **B** Dried white mulberry fruits.

White Mulberry *Morus alba*

Two species of mulberry are widespread in the Carolinas. The red mulberry is native and grows in moist woods and hardwood slopes. The white mulberry on the other hand, was introduced from China and is a common weed tree in urban areas. Although we focus on the white mulberry here, the two species are very similar in appearance, and the fruits of both can be used in the same manner. White mulberry, however, has sweeter, more flavorful fruits.

The white mulberry was introduced to North America in the early

1600s by English colonists who hoped to establish a viable silk industry—silkworms will feed only on white mulberry leaves. The town of Silk Hope, North Carolina, and the historic Silk Hope Plantation in South Carolina are reminders of the colonists' failed aspirations. But while the silk industry died in the Southeast, the white mulberry prospered.

Like all mulberries, the white mulberry is a medium-size tree with alternate simple leaves. Some of the leaves are lobed, but most are not. Trees are dioecious (unisexual), with inconspicuous flowers produced in early spring and fruits about a month later. Despite the name, white mulberry trees may have red, dark purple, white, or pink fruits. Hybrids with the native red mulberry are known.

We first encountered dried mulberries in the extensive bazaar in Sulaimani, Iraq, and were surprised by their sweet taste and chewy texture. Even though the black mulberry (*Morus nigra*) is native in the region and is used to prepare a delicious drink, dried mulberries are prepared from the introduced white mulberry. So we tried dehydrating the white fruits of the white mulberry. Like the Kurdish product, ours also had an enhanced sweetness after drying for twelve hours. Dried mulberries can be eaten as a treat or added to fruit salads.

Roots, Tubers, and Bulbs

The starches stored in roots, tubers, and bulbs provide the main substance of any meal consisting of wild plants. Many starch-dense species are broadly distributed in the Southeast, perhaps because pre-Columbian Native Americans either deliberately transported them or consciously preserved existing populations. In any event, most serious foragers make it a priority to recognize and harvest starch-producing plants like the ones in this chapter.

Broadleaf Arrowhead *Sagittaria latifolia*

Broadleaf arrowhead (also known as arrowleaf) is one of the most desirable wild edibles. Its turions—specialized stems that are filled with starch and have a growing tip—are produced in mid-to-late fall on its underground stems and have a pleasant, albeit sometimes slightly bitter, taste. The turions are the overwintering phase of the plant. They become detached from the host rhizome as it decays and can then be carried by water currents to establish a plant in a new location.

Broadleaf arrowhead is one of the most common and abundant aquatic plants in the Carolinas, although it's less common in South Carolina. It grows in freshwater marshes, ditches, the margins of streams, and other aquatic habitats. There are several other aquatic plants in the Carolinas with arrow-shaped leaves, but broadleaf arrowhead is the only one with milky juice, which you can spot by tearing the leaf.

A A stand of broadleaf arrowhead. **B** The white latex that characterizes members of this genus. **C** Broadleaf arrowhead turions ready for cooking.

The turions are not ready for harvest until late fall in the Carolinas. They can simply be roasted or boiled, or they can be sliced and dehydrated for preservation. There are numerous recipes online that use arrowhead turions.

Common Yucca *Yucca filamentosa*

Common yucca is a native clump-forming species found in scattered localities in the Carolinas, usually in open, sunny, and often sandy areas. It has also been grown in gardens as an ornamental.

For the forager, yucca is more ornery than ornamental, and preparing it is a tedious multiday task. After digging up the usually massive root system, wash the roots thoroughly and cut them into five-inch pieces (an ax works best for this) so that the pieces can fit into a large kettle or stockpot. Boil the roots, replace the water, and boil again, repeating this process until the often-extreme bitterness is removed. A second problem is the presence of saponins, which are mildly toxic and cause a foam that can easily bubble over the kettle. These are also removed with repeated boiling and water changes.

Cut the boiled roots into two-inch sections and peel them. The scaly bark is easily removed after boiling, but the tough and persistent lateral roots can only be removed with pliers. Taste the roots, and if

A Massive roots of yucca with their wiry lateral roots.
B Sections of yucca roots after processing.

they're still bitter—likely because of persistent tannins—soak them for a day or two. At this stage you should be able to cut the roots with a sharp knife. If not, return them to the kettle for more boiling.

By this time the bitterness should have been reduced enough that the roots are ready to cook. We fried ours in a light batter. At this stage—finally—the roots were edible, but they still had an aggravating bitterness.

Yucca roots are loaded with starch. We did not try pounding the boiled roots to extract the starch, but this has been done with similar starch-bearing plants. These abundant starch sources were once valuable for pre-Columbian Indigenous peoples, but today, only the most fervid foragers are likely to expend the strenuous effort involved in preparing them.

It's worth noting that the yucca's flowering stalk is much easier to prepare—see the chapter on flowers.

Field Garlic *Allium vineale*

Field garlic can be found in most counties in the Carolinas. It often forms massive populations in agricultural fields in the winter then dies back to its bulb. Field garlic is well adapted for its weedy life cycle. In late spring the flowering head produces tiny new plants that either fall or remain on the mother plant to produce small bulbs that are easily spread by lawn mowers and gardeners. Underground, the plant is producing young bulbs (bulbils) that easily detach from the plant and spread when the soil is disturbed.

This is a true garlic, but it has a much stronger flavor. For that reason, use it in much smaller quantities than regular garlic (*Allium*

A A flowering head of field garlic. Note the characteristic young plants produced by the sterile flowers. **B** Bulbs of field garlic.

sativum)—we recommend using about one-quarter the amount you would use for regular garlic. One way to preserve field garlic is to dehydrate it, but this takes several days. When they first emerge, the young field garlic stems can be used for flavoring—bearing in mind their potency.

Groundnut *Apios americana*

In their classic treatment of the edible plants of eastern North America, the irrepressible Harvard botanist Merritt Lyndon Fernald and coauthor Alfred Charles Kinsey (yes, the same Kinsey famous for his human sexuality research) say of the groundnut, "Probably no wild food plant of temperate eastern America so soon attracted the attention of the European colonist as the groundnut" (Fernald and Kinsey 1943, 254).

And rightly so. This is one of the premier edible plants in the flora of the Carolinas—and it tastes good. All parts of the plant are edible, and, being a legume, groundnut is nutritious and a nitrogen fixer, benefiting the soil by turning atmospheric nitrogen into compounds that act as fertilizers.

The tips and youngest leaves of the groundnut can be steamed and eaten as a vegetable. By late summer the long, narrow, green seedpods develop, and by autumn these open to release the hard brown seeds. The young fruits can be eaten like green beans, but only if they're collected when *very* young, before the tough fibers in the fruit coat develop. The mature seeds can be dried and have the flavor of field peas (*Vigna unguiculata*) when cooked.

A A groundnut plant. **B** Mature groundnut fruits. **C** Groundnut tubers. Note their distinctive arrangement along the thin rhizome, like beads on a rosary.

Late fall or early winter is the best time to collect groundnut tubers: at this point starch has been stored to fuel growth in the spring. Tubers should be located before the vines senesce for the winter. They are usually located within the first foot of soil and have a distinct morphology, arranged on the rhizomes (modified underground stems) like beads on a rosary. Leave a few of the tubers for next year's crop.

After scrubbing the tubers they can be prepared like potatoes: boiled, baked, or cooked in a microwave. Some older and larger tubers can have a thicker skin and can be peeled. After cooking, the tubers have a mild potato-like flavor and texture.

If you are fortunate enough to harvest more tubers than you can immediately use, they can be dehydrated. For dehydration, slice the tubers crosswise into discs. These store well and can be added to soups and stews.

A The flowering head of a Jerusalem artichoke. **B** Tubers on a mature Jerusalem artichoke plant. **C** Jerusalem artichoke tubers cleaned and ready to cook.

Jerusalem Artichoke *Helianthus tuberosus*

Despite its name, Jerusalem artichoke is not a true artichoke (*Cynara cardunculus*), nor does it have anything to do with Jerusalem—the origin of this common name is debated. The Jerusalem artichoke is a relative of the sunflower that produces starchy tubers. Native Americans were using it as a food source before Europeans arrived, and its wide distribution may be attributed to Native American agriculture. It is believed that Jerusalem artichokes were brought to the Carolinas from their original range in the Midwest.

This tall perennial can grow up to eight feet tall and has opposite leaves that have a sandpaper-like surface. It's found in a variety of open, sunny habitats.

The best time to collect the tubers is in the late fall, when the plant has stored starch for the next season. The tubers can be eaten raw and have a pleasantly resinous taste, or they can be cooked like a potato. They can also be made into sweet pickles. Jerusalem artichokes are grown commercially and marketed as "sunchokes."

A The bell-shaped flowers on this rampion bellflower are characteristic of the genus. **B** A rampion bellflower plant with well-developed roots.

Rampion Bellflower *Campanula rapunculoides*

"Rapunzel's radish" would be a good name for this European introduction. In the original story from the Brothers Grimm, Rapunzel's parents steal rampion from a witch, and when she catches them they promise to give her Rapunzel when she is born. The witch gives the baby the name Rapunzel, which means "rampion."

Rampion bellflower is a true bellflower, with attractive blue flowers. It may have been introduced to North America as an ornamental or a vegetable, like several other plants in this book, such as dandelion, chicory, and watercress. Like its fellow immigrants it escaped cultivation and has become a weedy species. When the roots are disturbed, they can easily fragment and establish new populations.

Rampion roots can be eaten raw or boiled and have a very pleasant, radish-like taste, even though the plant is not related to the radish (*Raphanus sativus*). The leaves are also edible (see the chapter on shoots and leaves).

A Virginia spring beauty. **B** Carolina spring beauty (© Shutterstock/ Sandy Photos). **C** Tubers from a Virginia spring beauty.

Spring Beauties

Carolina Spring Beauty *Claytonia caroliniana*

Virginia Spring Beauty *Claytonia virginica*

Both of these species deserve the appellation "spring beauty" because of their delicate pink flowers, which are produced in large numbers in the early spring—a true harbinger of the season. Spring beauty plants are seldom more than five inches tall and have edible succulent leaves. The two species are readily distinguished by the shape of the leaves: those of the Virginia spring beauty are narrow, while those of the Carolina spring beauty are more like the bowl of a spoon. Virginia spring beauty is frequently found in the Piedmont of North Carolina and is less common in South Carolina. Carolina spring beauty, on the other hand, is restricted to the mountains of North Carolina.

Both species grow in rich deciduous woods and are true spring ephemerals: they need to complete their life cycle before the forest canopy closes. It is not unusual to find plants with mature seeds and flower buds on the same stem. What enables these denizens of the forest to complete their life cycle so rapidly is the large amount of starch stored in the tubers, which powers their vernal appearance.

The tubers have a potato-like taste and are easy to collect just a few inches below the plant, but harvesting destroys the population. The ease of collection, abundance of starch, and edible leaves made miner's lettuce (*Claytonia perfoliata*), a western species, an important food source for pre-Columbian Native Americans.

Cordials and Aperitifs

Cordials, aperitifs, digestifs, liqueurs, bitters—the terminology of flavored alcoholic beverages can be confusing. Here we employ the term "cordial" to describe drinks sweetened by table sugar and/or sugars naturally present in the plants and the term "aperitif" for unsweetened drinks. Following culinary tradition, a digestif is drunk after a meal, regardless of its sweetness or bitterness. If imbibed before the meal, it is an aperitif. Several drinks in this section call for simple syrup, which is a solution of equal parts table sugar and water.

There are popular legends about groups of medieval monks in Europe perfecting herbal liqueurs such as Benedictine, Chartreuse, and Mechitharine over many centuries. Unfortunately, there's no similarly long record of alcoholic experimentation with the native plants of North America. But what recipes for liqueurs made from native plants lack in longevity, they make up for in variety: the entries included here are a small selection of the 250 preparations we have tried.

While we enjoy alcoholic drinks, our purpose in mixing plants and alcohol is to examine how these preparations alter the flavors of the plants. Flavor compounds have varying solubility in alcohol, and the resulting infusion can taste entirely different from the raw or cooked plant. The only alcohol we use is vodka, and we use just one plant species in each drink in order to isolate its flavors and aromas. However, professional mixologists assure us that for adventurous palates, many of the native plants in the Carolinas can be combined in a recipe.

Most of the cordials here will maintain their flavor for a year at room temperature; to keep for more than a year, they should be refrigerated.

A The large compound leaves of a black walnut tree, which have a distinct aroma. **B** Green walnuts suitable for collecting. **C** A cordial made with black walnuts.

Black Walnut *Juglans nigra*

This tasty cordial is similar to the Italian liqueur nocino, which has been made with English walnuts (*Juglans regia*) since at least the Middle Ages. Green (unripe) whole walnuts are infused in a distilled alcohol base, then mixed with simple syrup.

The most difficult part of the preparation is finding a black walnut tree with accessible young fruits. Black walnut trees are widespread in the Carolinas but most abundant in the Piedmont and mountains. A single tree yields enough to make gallons of cordial, but it is often desirable to harvest fruits from several trees in order to blend slightly different flavors and fruits in various stages of ripeness. Gather fruits in the early fall, and be sure to select those that have not been damaged by insects. In contrast to the instructions in most recipes, we do not cut the young fruits—we simply pack them in a large container and submerge them in vodka. Store in a cool, dark place. After about a month, remove the fruits. To the liquid in the container, add one cup of simple syrup for every two cups of vodka.

This cordial improves dramatically with at least six months of

aging. When it's ready to drink, it's a rich dark brown (it will look black in a large bottle) and has an intensely medicinal aroma. We found our preparation made with black walnuts far more flavorful than the commercially produced versions that use English walnuts. *Salute!*

A Ripe berries on a highbush blueberry plant (© Shutterstock/ Studio Barcelona). **B** Highbush blueberry flowers. **C** A cordial made from highbush blueberries.

Blueberries Genus *Vaccinium*

The Carolinas are home to numerous blueberries species with varying habits and diverse habitats. Many of these, such as highbush blueberry (*Vaccinium corymbosum*), black highbush blueberry (*Vaccinium fuscatum*), Blue Ridge blueberry (*Vaccinium pallidum*), and small black blueberry (*Vaccinium tenellum*), have fruits resembling the commercial blueberry in color and flavor.

A The distinctive deerberry flowers, with protruding stamens. **B** Ripe deerberries. **C** A cordial made from deerberries.

A unique blueberry is one that's not even blue, the deerberry (*Vaccinium stamineum*). When ripe, its fruits are green, firm, and sour, like a green apple. But prepared as described below, this overlooked edible creates a tasty cordial with a rich, fruity flavor.

Not all blueberries are winners. The farkleberry (*Vaccinium arboreum*), for example, has fruits that are dry, gritty, and mostly flavorless. Unfortunately, the addition of sugar and vodka does little to improve this species.

Without crushing the fresh fruits, we toss them with enough sugar to thoroughly coat the fruits, about two tablespoons per cup of fruit, and place them in an airtight container in the refrigerator for two weeks. The sugar will osmotically draw juice out of the blueberries. Discard the solids and mix the blueberry syrup with vodka to taste—we prefer equal amounts of each. This cordial made with blue or black blueberries tastes much like the raw berries, but the deerberry cordial tastes very different.

A Flowers of Canadian serviceberry, one of the first shrubs to flower in the spring. **B** Coastal Plain serviceberry fruits.

Canadian Serviceberry *Amelanchier canadensis*

There are numerous species of *Amelanchier* across the Carolinas, including serviceberry, shadberry, and juneberry. We decided to use Canadian serviceberry for a cordial because it is common in the Coastal Plain and has been increasingly planted as an ornamental, but we've found that other species work equally well with this preparation. Most tasty among those we have sampled is Coastal Plain serviceberry (*Amelanchier obovalis*).

Monitor trees throughout spring—despite the common name "juneberry," the fruit can mature as early as May. You will be competing with birds to get the ripest fruits, but in a good year you can gather pounds from a single tree. Try to avoid crushing the fruit, though this is difficult because the ripest become very soft.

Mix each cup of fruit with two tablespoons of sugar and put it in an airtight container in the refrigerator for up to a week so that the sugar can draw juice out of the fruit. Watch the mixture closely, though, because wild yeast can begin fermenting the syrup. Strain the syrup, discard the solids, and mix the syrup with one cup of vodka. The fruit syrup doesn't look very appetizing—it's usually murky brown. But the flavor is a pleasant blend of caramel and berries.

A Maturing black cherry fruits.
B A cordial made from black cherries.
C Masses of black cherry flowers are produced in early spring.

Cherries Genus *Prunus*

Wild cherries are abundant in the eastern United States and in the eighteenth century were known as a food and medicine to Native Americans, who shared their knowledge with European colonists. While Martha Washington's recipe for the cordial cherry bounce calls for European cherry varieties, one can imagine that native cherries were substituted when those were unavailable.

Black cherry (*Prunus serotina*) is widespread across the Carolinas, while chokecherry (*Prunus virginiana*) and pin cherry (*Prunus pensylvanica*) are restricted to the mountains. The fruits of black cherry are indeed black when fully ripe, while chokecherries become dark red and pin cherries a bright, translucent red. Each species is edible raw and has a distinct cherry flavor, though most fruits are also slightly sour, bitter, and astringent. Luckily, a cordial preparation removes these unpleasant aspects.

Coat one cup of whole fruits with two tablespoons of sugar and place in an airtight container in the refrigerator for up to one week to allow the cherry juice to be extracted. Do not crush the cherries; the pits contain cyanide precursors that impart a bitter flavor. After a week, discard the solids and mix the cherry syrup with vodka, two parts cherry syrup to one part vodka.

Each cherry species yields a unique beverage. Black cherry cor-

Partially ripened chokecherry fruits.

dial has a deep-red hue and tastes like cherry cough syrup with hints of spice. Chokecherry cordial has a rose-to-pale-orange color and a pure cherry flavor with a long, smooth finish; it was voted the best of these three cherry cordials by our tasting panel. Pin cherry cordial has a light-red color and clean cherry flavor. You can experiment with blending all these cordials. One of our favorite blends is a mixture of three parts chokecherry cordial to one part black cherry cordial—it combines the color and aroma of black cherry with the long finish of chokecherry.

An elderberry bush in flower.

Common Elderberry *Sambucus canadensis*

In early spring large elderberry shrubs can be spotted in wet, sunny locations by their broad, flat inflorescences, which are made up of hundreds of small white or pale-yellow flowers. Avoid harvesting the flowers after rainfall, which will wash away the flavorful nectar.

This elderflower champagne is not a cordial or aperitif but a fermented wine. It's based on an English recipe, but it substitutes native

elderflower for the closely related European black elderberry (*Sambucus nigra*).

To make approximately two gallons, collect about fifteen large inflorescences, shaking them vigorously to remove the many insects attracted to the nectar. If you won't use them immediately, they can be refrigerated up to a week. Dissolve two pounds of sugar in two gallons of boiling water. Let the water cool to room temperature, then add the elderflowers and the juice and zest from one lemon. Mix well. Cover the container with a towel (or use a brewing container with airlock if available) and leave it out at room temperature. The wild yeasts on the flowers are usually sufficient to begin fermentation, but if there are no bubbles of carbon dioxide or a "boozy" smell after a few days, add a five-gram packet of champagne or white wine yeast. Baking yeast can be used, but it results in a "bready" taste.

One week after signs of fermentation are evident, taste the liquid: it should be slightly sweet. If it's not, add a quarter-cup of white sugar to promote carbonation. Then filter the liquid through cheesecloth into bottles for final fermentation. Plastic bottles with screw-on caps work well because you can monitor the pressure in the bottles by squeezing them once a day. When a bottle becomes rock-hard, open it to relieve some pressure. We know from personal experience that explosions can occur.

Over about two weeks, fermentation in the bottles will slow and the champagne will become less sweet and more dry. If you prefer a sweeter wine, fermentation can be slowed further by moving bottles into the refrigerator. Enjoy this floral, lemony brew once the flavor reaches your personal preference.

Licorice goldenrod forms large populations in coastal forests.

Licorice Goldenrod *Solidago odora*

Most people feel the same way about this licorice goldenrod aperitif as they do about licorice candy: they either love it or hate it. Licorice goldenrod can be found throughout the Carolinas but is most common in dry sandy woods, such as longleaf pine uplands. This species has the arrangement of golden flowers typical of goldenrod, but it has unique leaves that smell strongly of licorice when crushed.

Preparation of the aperitif is simple: collect fifteen to twenty leaves and steep them in one cup of vodka for two weeks. We suggest using leaves from several plants because the strength of the flavor varies among plants. A tablespoon of sugar can be added to soften the intensity of the licorice.

A Red chokeberry flowers in spring. **B** Red chokeberry fruits ripen in the early winter and can remain on the shrub until January. **C** A cordial made from red chokeberries.

Red Chokeberry *Aronia arbutifolia* or *Photinia arbutifolia*

The name "chokeberry" does not inspire confidence in the plant's edibility. But this widespread shrub of swamps, bogs, pocosins, and other wet habitats produces one of our most surprising and delicious cordials.

Red chokeberry is found throughout the Carolinas. The clusters of bright-red fruits ripen in the fall and often persist through the winter. Red chokeberry can grow with and resemble inedible deciduous hollies (species of *Ilex*), but the chokeberry is easily distinguished by the short black hairs scattered on the upper surface of its leaves.

Because the fruits tend to be dry, we prepare them before making the cordial by soaking one cup of fruit in a half-cup of simple syrup. After one week the syrup will take on a pale amber color and can be mixed with a half-cup of vodka. Though the raw fruits are as astringent as an unripe persimmon, this cordial has a complex flavor profile with hints of candied orange peel, bitters, and cinnamon.

Unlike red chokeberry, the fruits of the less-common black chokeberry (*Aronia melanocarpa*) are practically worthless for eating—their flavor has been described as rust, rubber, and "yuck."

A The sugarberry bark is distinctive among trees in the Carolinas. **B** Mature sugarberry fruits. **C** Leaves from a sugarberry tree.

Sugarberry Genus *Celtis*

If you're new to making cordials, this is the place to start: the preparation couldn't be simpler, and the cordial is delicious.

There are several species of sugarberry trees, also known as hackberry, throughout the Carolinas. All species are easy to identify by their gray bark with corky warts. Their leaves are alternate, with asymmetrical leaf bases. Their flowers are green and inconspicuous, and in the fall they yield the distinctive chestnut-brown fruits, which are about the size of garden peas. The single-seeded fruits are surrounded by a thin, papery layer that is very sweet.

Place two tablespoons of the fruits in a cup of vodka in an airtight container. Within six weeks you will have a naturally sweetened cordial. The taste is rich and complex, with hints of chocolate and molasses.

A Swamp bay leaves are leathery and evergreen. **B** The underside of a swamp bay leaf. Note the characteristic dense brown hairs. **C** A small swamp bay tree in a coastal swamp. **D** An aperitif made with swamp bay leaves.

Swamp Bay *Persea palustris*

This is a very easy drink to prepare, and unlike the others in this book, it can be made any time of the year because swamp bay leaves are evergreen. This common shrub or small tree is widespread in maritime forests and swamps of the Coastal Plain and can be readily identified by its pungent bay leaf odor. This odor reveals its kinship with the bay leaf used in cooking (*Laurus nobilis*).

As for other aperitifs, always collect swamp bay leaves from an assortment of plants, since there can be considerable variation in the concentration of the aromatic compounds between individual plants. Select leaves that are free of the gall caused by a psyllid, one of a group of jumping plant lice. Break five leaves in half, place them in an airtight container, pour in two cups of vodka, and store for two months.

The drink has a pungent, bay leaf/basil flavor. It's good before a meal of red meat.

Flowering heads of wild bergamot.

Wild Bergamot *Monarda fistulosa*

Wild bergamot should not be confused with bergamot oil, which is derived from the unrelated bergamot orange (*Citrus bergamia*), a member of the citrus family. The origin of the name "bergamot" for this plant is unknown, but presumably this fragrant member of the mint family reminded European colonists of the citrus bergamot.

In the Carolinas, wild bergamot is primarily restricted to the mountains, though other species of *Monarda* are present in the Piedmont and Coastal Plain and could be substituted.

We steep fifty inflorescences in three cups of vodka for at least one month. This preparation is not for everyone. It has a menthol flavor that is too medicinal for some palates and may be better suited for blending.

See the chapter on flowers for other uses of wild bergamot.

Acknowledgments

Humans use plants for fibers, timber, medicines, ornamentals, and much more, but the most obvious and the most intimate way we use plants is for food. We are what we eat, and we are influenced by who we eat with. Collectively enjoying the search for edible plants and preparing them produces a bond among wild-food enthusiasts, a table fellowship. This coterie has contributed so much to this book.

The information we present here incorporates the efforts of many students and colleagues over a combined twenty years. We have learned so much from these folks, and the omission of anyone is to be regretted.

An enthusiastic group of these foragers includes our students, whose labors have taught us about an array of edibles, several of them actually tasty. Toni Dotterer introduced us to the culinary value of river oats and the pasta made from it. Ritsushi Miyamoto prepared flour from American lotus. We had our first taste of kunuche through the efforts of John C. White. Patric Carpenter dug yucca roots, extricated cattail rhizomes from a muddy miasma in the Great Dismal Swamp, and much more. Doug Davis found fruiting cane when he wasn't looking and has been looking ever since. Biologist-turned-Paris-trained-chef David Babineau shared glasswort recipes.

Nick Flanders helped with collecting through several growing seasons. Jay Bolin joined us on many field excursions and helped locate species of interest. For many years David Knepper has participated in field trips and kept us abreast of new locations. Harold Wiggins provided logistical support, singing, and locations for foraging.

Our students in ethnobotany and other classes at Old Dominion University, Mountain Lake Biological Station, Cranberry Lake Biological Station, American University of Beirut, and American University

of Iraq, Sulaimani, have collected and prepared innumerable cattail meals and other culinary almost-delights. No undergraduates were harmed in these courses.

Other field trip companions and helpers include Saman Ahmad, Isaiah Amos, Nathaniel Auld, David Cutherell, David Hagyari, Lisa Kolgan, Steven Leonard, Darren Loomis, David McCulloch, Andrew Miller, Michael Miller, John Musselman, William Owen, Chris Randle, Jason Singhurst, Frankie Snow, and Carl Taylor. Omission of any of our fellow foragers is regretted.

In addition to the support of this fellowship of foragers and friends, we have received generous institutional support. First and foremost, the Mary Payne Hogan Endowment at Old Dominion University provided financial support for this book and the many projects that led up to it. We acknowledge the largesse of the Plant Research Fund at Old Dominion University as well. Logistical support from the University of Virginia Mountain Lake Biological Station and the Cranberry Lake Biological Station of the State University of New York College of Environmental Sciences and Forestry is acknowledged. A distinctive feature of our book is the section on cordials. The Humble Steward, the nom de plume of wine columnist Jim Raper, critically reviewed our brews and gave helpful evaluations and descriptions.

Numerous state and federal agencies provided access, permits, and assistance through their employees. These parks, forests, and refuges extend from Merchants Millpond State Park in northeast North Carolina to Edisto Beach State Park in South Carolina, from Pilot Mountain to Pickens, and places in between. We value access to Natural Heritage and Nature Conservancy lands in both states as well. We hope this book will increase appreciation of the marvelous diversity of the Carolinas' flora and its conservation, as exemplified in these places.

The photos of kunuche were taken by John C. White, and a few photos appeared in *The Quick Guide to Edible Plants* by Lytton John Musselman and Harold J. Wiggins. The rest of the photos were taken for this book by Lytton John Musselman, unless otherwise noted.

It has been a pleasure working with UNC Press. We value the encouragement, careful editing, and wise counsel we received from Lucas Church and Erin Granville and the other staff who helped us. Our book is much better as a result of their efforts.

Finally, and foremost, we thank our families for their unflagging support.

Glossary

alternate leaves leaves that emerge singly along the stem

capsule a dry fruit with many seeds
circumneutral soil soil that is neither acidic nor basic
compound leaf a leaf whose blade is divided into leaflets

dioecious unisexual; each plant bears exclusively staminate or pistillate flowers

foredune a dune fronting the ocean
fruit the ripened ovary of a plant

habit the appearance or mode of growth, as tree, shrub, vine, or herb
halophyte saline-loving plant found near oceans and other salty environments
herbaceous not woody

inflorescence the arrangement of flowers on the floral axis
infructescence the cluster of fruits formed on the inflorescence

latex a liquid produced by some plants, usually white and slightly viscous
liana a woody vine

mucilage a slimy substance produced by plants

nectary a structure that produces nectar

opposite leaves leaves that emerge in pairs on opposite sides of the stem

overstory canopy of leaves in a forest

phenology the timing of the seasonal appearance of plant parts

pistillate bearing one or more pistils, the female part of the flower (ovary)

potherb leaves or stems cooked as a vegetable

rhizome an underground stem, usually growing horizontally

senesce to die or deteriorate in old age

simple leaf a leaf whose blade is not divided into leaflets (but can be deeply lobed)

staminate bearing stamens, the male part of the flower

terminal bud the bud that terminates a twig (usually applied to woody plants)

tuber the swollen portion of a rhizome, where nutrients are stored

turion a winter bud and storage tissue of an aquatic plant, usually produced underground or underwater

wrack line line of debris deposited on a beach at high tide

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General Index

Index of Scientific Names

About the Authors

Lytton John Musselman is the Mary Payne Hogan Distinguished Professor of Botany at Old Dominion University, former chair of the Department of Biological Sciences, and the recipient of four Fulbright awards. One of his interests is ethnobotany, broadly defined as the human use of plants, past, present, and future. Lytton's ethnobotanical research centers on plants in sacred writings, parasitic weeds in African agriculture, and useful wild plants of the Southeast.

He has taught courses in the use of local plants at his home institution as well as the State University of New York School of Environmental Biology and Forestry at the Cranberry Lake Biological Station in the Adirondacks, Au Sable Institute of Environmental Studies in Michigan, and the University of Virginia Mountain Lake Biological Station.

Lytton's ethnobotanical research has centered on two broad geographical regions. The first is the Middle East, where he was a visiting professor in four countries and studied the uses of plants in ancient times. His research there resulted in three published volumes: *Jordan in Bloom: Wildflowers of the Holy Land*, commissioned by Queen Rania of Jordan (2000); *Figs, Dates, Laurel, and Myrrh: Plants of the Bible and the Qu'ran* (2007), with a foreword by Garrison Keillor; and *A Dictionary of Bible Plants* (2011).

Closer to home, he has coauthored *Chesapeake Bay Plants* (2012) with David Knepper and *Wildflowers of the Adirondacks* (2020) with Donald Leopold. In 1984 he established the Blackwater Ecologic Preserve. As the preserve manager, he oversees research to maintain and restore an exceptionally rare northern longleaf pine community.

Edible wild plants have been a lifelong interest. Most years during the past four decades Lytton has taught a course in that topic, leading

two generations of undergraduates in tasting, munching, and grazing the landscape. This led to *The Quick Guide to Wild Edible Plants* (2013) with former student Hal Wiggins.

Peter Schafran is a National Science Foundation Postdoctoral Fellow at the Boyce Thompson Institute in Ithaca, New York. His work focuses on generating new genomes from hornworts to understand different species' genes, genome evolution, and adaptations to their environments. He received his PhD from Old Dominion University in Norfolk, Virginia, and spent several years as a fellow and research associate at the Smithsonian National Museum of Natural History in Washington, D.C., where he studied the evolution and speciation of quillworts in the Southeast, which is a global biodiversity hotspot for these distant relatives of ferns. He has taught botany courses at Old Dominion University, the American University of Iraq—Sulaimani, and the Cranberry Lake Biological Station at the State University of New York College of Environmental Science and Forestry.

Peter first became interested in edible wild plants while studying under Lytton Musselman at Old Dominion University. For his master's thesis, he documented the use of a wild pistachio in the Kurdistan autonomous region of Iraq. Over many years, he and Lytton have tested hundreds of preparations of plants from the eastern and midwestern United States for suitability as flavoring agents in alcoholic beverages, most of which had never been previously recorded. They have led several edible plant workshops at the Norfolk Botanical Garden in Virginia and the Mt. Cuba Center in Delaware.

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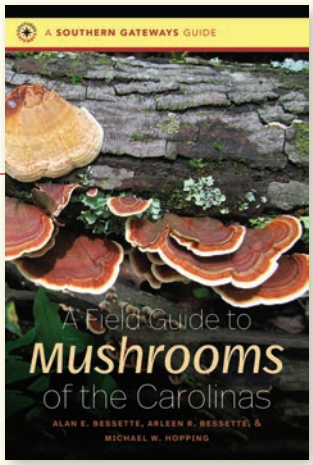

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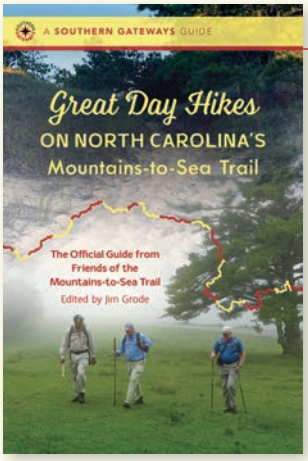

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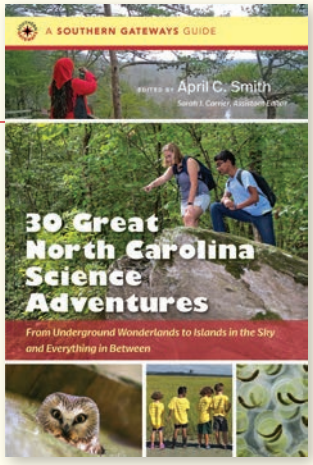

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Mac H. Alford, University of Southern Mississippi

"I thoroughly enjoyed the treatments of each plant and the understated humor sprinkled throughout. The book even helped me generate a few ethnobotany research questions for my students to investigate! This fascinating book will be of interest to casual readers, beginning botanists, and professionals alike."

Jay Bolin, Catawba College

Foraging edible plants was once limited to specialists, survivalists, and herbalists, but it's become increasingly mainstream. Influenced by the popularity of the locavore movement, many restaurants feature foraged plants on their menus, and a wide variety of local foraged plants are sold at farmers markets across the country.

With *Edible Wild Plants of the Carolinas,* Lytton John Musselman and Peter W. Schafran offer a full-color guide for the everyday forager, featuring:

- Profiles of more than 100 edible plants, organized broadly by food type, including seeds, fruits, grains, and shoots
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- Full-color photos that make it easy to identify edible plants

Edible Wild Plants of the Carolinas is designed to help anyone enjoy the many wild plants found in the biodiverse Carolinas.

Lytton John Musselman is the Mary Payne Hogan Distinguished Professor of Botany at Old Dominion University. **Peter W. Schafran** is a postdoctoral scientist at the Boyce Thompson Institute in Ithaca, N.Y.

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ISBN 978-1-4696-6496-5