

Abundant Future: Cultivating Diversity in Garden, Farm, & Field



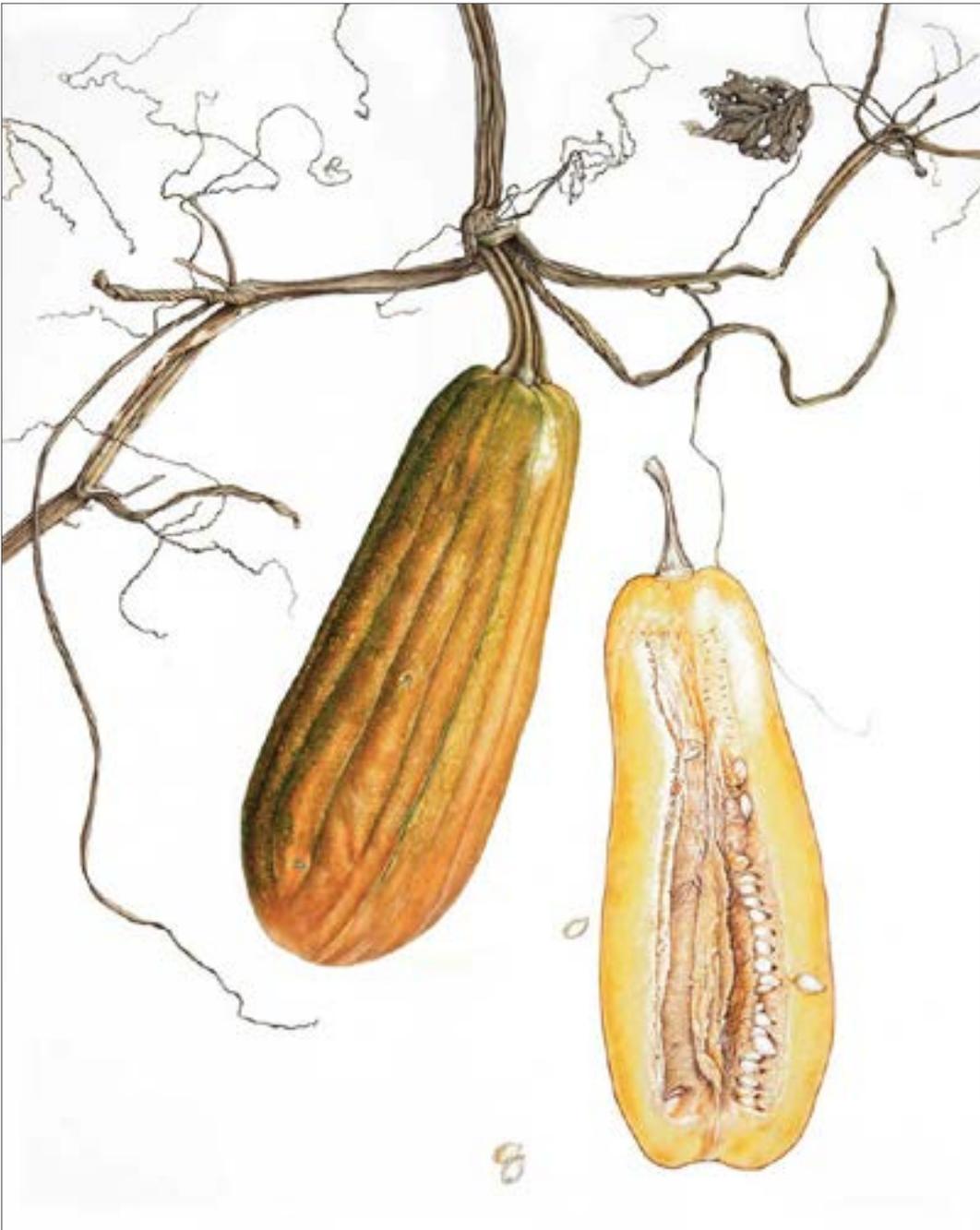
The Fourth New York Botanical Garden Triennial
November 21, 2020–March 26, 2021

Abundant Future: Cultivating Diversity in Garden, Farm, and Field celebrates the astonishing diversity and fascinating history of cultivated plants grown for clothing, healing, and most of all, for food. The subjects of these works were discovered on international travels, picked up at the farmer's market, even plucked from artists' own gardens. As the artists spent time with their chosen plants to ensure faithful depictions, they each learned about the history of cultivated varieties or the significance of wild relatives that played an important role in yielding the fruits and vegetables we know today. The exquisite works on view here celebrate the artistry of plant breeding; the challenges of maintaining genetic diversity in domesticated crops, many of which have lost traits that can help them resist climate change, environmental stresses, and disease; and the potential for rejuvenation to be found in heirloom and ancient plant revival.

Pumpkins, Squashes, and Melons

There are hundreds of species in the Cucurbitaceae (cucurbit) family. Pumpkins, squash, gourds, melons, and even gherkins were first cultivated in Central America.

Species native to Central America, *Cucurbita pepo*, *C. moschata*, and *C. maxima*, were dispersed through trade and have become integral to cuisines worldwide. These species were bred through selection and hybridization to best suit the culinary needs of each culture. In Korea, *Cucurbita moschata*—typically thought of as tough-skinned squash or pumpkin with a “shell” like that of butternut squash—was bred to produce a thin-skinned, summer squash called *aehobak*, which is used in a multitude of recipes in Korean cuisine.



Sengmany Phommachakr

Long Pie Pumpkin

Cucurbita pepo 'Long Pie'

Watercolor on paper

28 1/8 x 20 5/8 inches



Damodar Lal Gurjar

Pumpkin

Cucurbita moschata

Tempera on paper

15 x 22 inches



Kelly Radding

Charentais Melon

Cucumis melo 'Charentais'

Egg tempera on panel

10 x 8 inches



Tammy McEntee

Blue Hubbard Squash

Cucurbita maxima 'Blue Hubbard'

Colored pencil on paper

20 x 25 inches

The Three Sisters Hand Lens



Akiko Enokido

Shishigatani Kabocha Pumpkin

Cucurbita moschata

Watercolor on paper

18 x 18 inches



Lara Call Gastinger

Mexican Sour Gherkin

Melothria scabra

Watercolor on paper

15 x 15 inches



Seongweon Ahn

Fordhook Zucchini

Cucurbita pepo 'Fordhook'

Colored pencil on paper

11 1/2 x 16 1/2 inches

Nightshades

The Solanaceae (nightshade) family consists of thousands of species. These include potatoes, peppers, tomatoes, tomatillos, eggplants, and others. Members of this family can be found on every continent except Antarctica. The plants appear in the form of herbs, shrubs, trees, vines, and sometimes **epiphytes**—plants that grow on other plants, not in soil. While some nightshades are edible, many are poisonous to humans, including deadly nightshade (*Atropa belladonna*), woody nightshade (*Solanum dulcamara*), and jimson weed (*Datura stramonium*), which contain toxic levels of alkaloids.



Anne Mantini

Rosa Bianca, Immigrant Eggplant
Solanum melongena 'Rosa Bianca'
Colored pencil on paper
15 x 10 inches

Eggplants, *Solanum melongena*, are believed to be native to India or Africa, though they have been cultivated across Southeast Asia for centuries. Eggplants were domesticated from *S. incanum*, a wild member of the nightshade family.



Lizzie Sanders

Edinburgh Potato

Solanum x edinense

Watercolor on paper

13 x 20 inches



Jean Emmons

Eggplants

Solanum melongena 'Black Beauty',

Solanum melongena 'Pingtung Long',

Solanum melongena 'Listada de Gandia',

Solanum melongena 'Casper',

Solanum melongena 'Thai Green',

Solanum aethiopicum

Watercolor on vellum

13 x 15 inches

Eggplants come in all shapes, sizes, and colors and can be found around the world, including at The New York Botanical Garden. In our Edible Academy we grow eggplants from countries far and wide in our plant beds.



Asuka Hishiki

Zapotec Pleated Heirloom Tomato

Solanum lycopersicum 'Zapotec Pleated'

Watercolor on paper

8 1/2 x 10 1/2 inches

Did you know that all 7,000 varieties of tomatoes represent one species (*Solanum lycopersicum*)? In the William and Lynda Steere Herbarium we have hundreds of varieties documented.

See some of our collection here.



Janene Walkky

Jimmy Nardello Sweet Italian Peppers

Capsicum annuum 'Jimmy Nardello'

Watercolor on paper

9 1/4 x 11 1/2 inches

Grow Your Own Peppers

Soybeans

Soybeans, *Glycine max*, are native to East Asia and are a key part of the regional cuisine. Soy sauce, tofu, bean paste, and tempeh are all derived from soybeans. A familiar side dish, edamame is made from steamed whole soybeans. The word edamame suggests how soybeans grow from a central stalk, **eda** meaning stem and **mame** meaning bean. Soybeans come in a few colors such as green, black, and brown. Black soybeans are used to create kuromame, or sweet black beans, which is an important part of the traditional Japanese New Year's feast, Osechi Ryori. While the beans are already very black, many recipes call for the addition of iron to make the color even darker.



Akiko Enokido

Black Soybean 'Tambaguro'

Glycine max

Watercolor on paper

18 3/4 x 19 3/4 inches

Akiko Enokido

Black Soybean 'Tambaguro'

Artist Story

Edamame is now a popular appetizer worldwide. In Japanese, **eda** means stem, and **mame** means beans. According to literature from 300 years ago, soybeans were boiled and sold attached to the branches, often on side streets. It is said that edamame originated in this era. When black soybeans were sold as edamame, it was misunderstood to be rotten and was unpopular, since they turn bluish-gray when boiled. Now we know that this color is due to anthocyanin in the skin of beans. Since black soybeans edamame are bigger and tastier than normal edamame, it is now considered a delicacy. At the farms in Tamba Sasayama, one third of black soybeans are sold as edamame each October. The rest are harvested in November, dried and used as an important ingredient for New Year's traditional dishes, as they have been since the early history of Japan.



Lynne Railsback

Soybean

Glycine max

Watercolor on paper

13 1/2 x 10 1/2 inches

Grains



Sally Petru

Sorghum

Sorghum bicolor

Watercolor on paper

25 x 12 inches



Jee-Yeon Koo

Revival after 100 Years

Oryza sativa

Watercolor on paper

23 5/8 x 21 inches

Jee-Yeon Koo

Revival after 100 Years

Rice is a staple around the world. There are two main species—*Oryza glaberrima*, African rice, and *Oryza sativa*, Asian rice—with hundreds of varieties. Rice is an important crop economically and nutritionally, and its cultivation is labor- and skill-intensive. In East Asia, farmers flood their rice fields to discourage weeds from overtaking the fragile plants. Once the rice has matured—about three months—the plant needs to be **threshed**, separated from the hulls that contain the grains. Then the hulls need to be winnowed in order to extract the grain.

In Korea, a farmer named Geun Yi Lee is working to restore native Korean strains of rice. During Japanese occupation, these strains of rice were all but replaced by more disease-resistant Japanese strains. His work has yielded the rediscovery and cultivation of more than 16 heirloom varieties.

Learn more about how the enslaved men and women from West Africa who were transported to South Carolina contributed to the rice growing process through innovative tools and highly specialized skills.

The nomenclature of sticky rice



Deborah Dion

Foxtail Millet, Three Species

Setaria italica, *Setaria viridis*, *Setaria faberi*

Watercolor, gouache, and graphite on paper

18 x 12 inches



Linda Medved Lufkin

Glass Gem Corn

Zea mays 'Glass Gem'

Watercolor on vellum

11 1/2 x 9 1/2 inches



Albina P. Herron

Seneca Red Stalker Corn 2

Zea mays 'Seneca Red Stalker'

Watercolor on paper

24 x 18 inches

Zea mays, or maize, is native to Mexico and Central America. **Learn more about the diverse specimens of maize in our Herbarium.**



Susan Mintun

Emmer Wheat

Triticum turgidum subsp. *dicoccon*

Watercolor on paper

27 1/2 x 15 inches

Poppies

Of over 200 poppy species, only *Papaver somniferum* produces the poppy seeds we find in grocery stores. A milky sap or latex extracted from *P. somniferum* seed capsules is used for the production of opium, codeine, morphine, heroin, and other controlled substances, giving it the common name opium poppy. However, far more seeds are produced than latex, and the seeds contain only trace amounts of the alkaloids that make those substances potent. The seeds of *P. somniferum* are frequently used in baked goods such as breads, muffins, and bagels, lending its more apt common name, breadseed poppy.

For thousands of years, the process of harvesting opium has changed little. The bulbous seed pod emerges after the flower has bloomed, and harvesting, or “milking,” occurs when the pod is still green. When the fleshy part of the pod is slit, a milky substance leaks out and hardens on the seed pod. This “opium gum” is separated from the pod using a curved spatula and then dried to be further processed or shipped. The process for harvesting seeds requires leaving the stem and seed pod untouched to ripen, allowing the seeds to mature and become useable. Once the pod has become brown and woody, the seed pod can be cut off and split open to reveal hundreds of small black seeds.



Pavlina Kourkova

Traseny Mak Poppyheads

Papaver somniferum

Watercolor on paper

11 x 16 inches

Take an up-close look at one of our poppy specimens from the Herbarium. You can see the jagged edges of the leaves and the spherical seed pods at the ends of the stems.

Fruit Trees

Most fruit trees require some type of pollination in order to bear fruit. Pollination occurs when the ovules of a plant are exposed to pollen from the male element (anther) of the plant. Typically insects help the process of pollination by carrying pollen from one flower to another. Fig trees are pollinated solely by one specific species of wasps. The tiny wasp (*Wiebesia contubernalis*) is able to fit into the small immature fruit and pollinate the small flowers within it. In turn, the fig serves as the ideal place for the female wasp to lay her eggs, providing the larvae nourishment and shelter.



Margaret Best

Portuguese Quince

Cydonia oblonga 'Portugal'

Watercolor on paper

14 7/8 x 10 inches

Portuguese Quince and San Rafael Quince on grounds



Joan McGann

San Rafael Quince

Cydonia oblonga 'San Rafael'

Ink on illustration board

13 1/2 x 14 inches



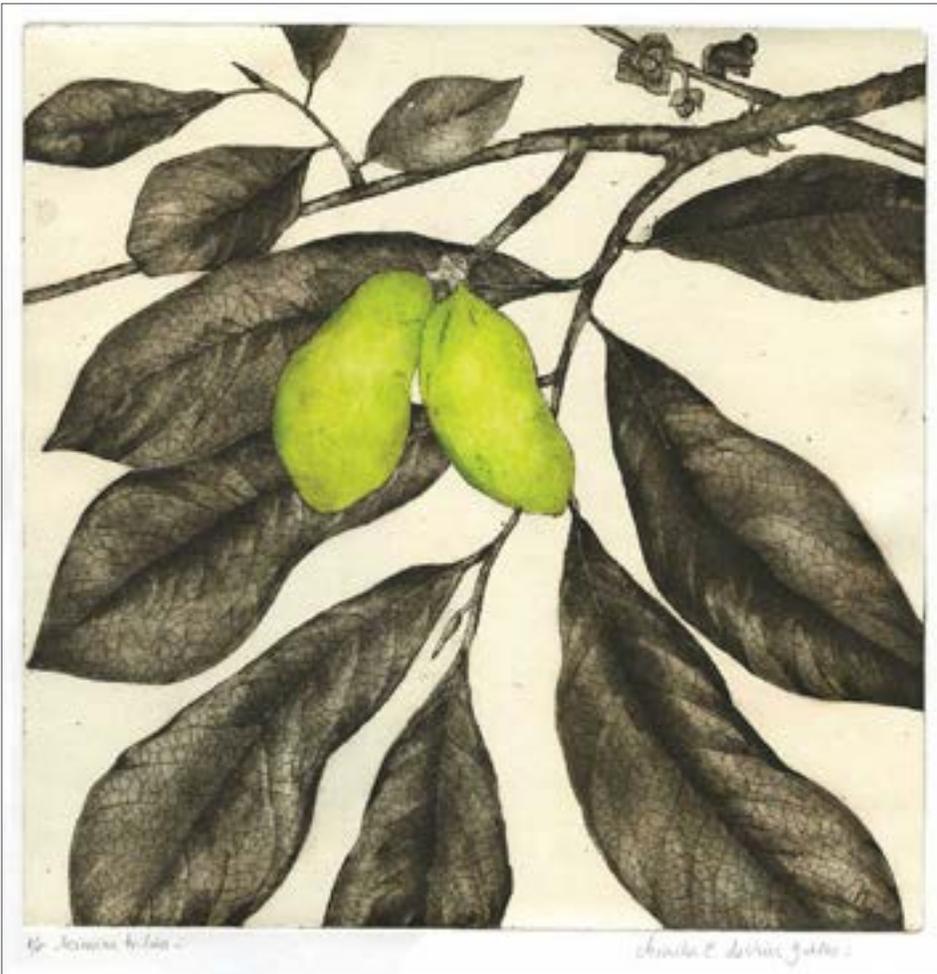
Eunike Nugroho

Mutual Dependence (Wild Fig and Wasp)

Ficus punctata, *Wiebesia contubernalis*

Watercolor on paper

11 7/8 x 19 3/4 inches



Monika DeVries Gohlke

Pawpaw

Asimina triloba

Copperplate etching, hand-colored

12 x 12 inches

While pawpaw is native to the eastern United States and fairly common, most people have probably never seen the tree's yellow-green fruit. Noted for its creamy texture and tropical taste, pawpaw fruit requires pollination to grow. Pollination is a bit trickier for pawpaws than for other fruit trees because they need pollen from an unrelated pawpaw tree. Pawpaws grow in groves, comprised of a mother tree and genetically identical offspring, which can span acres. For a pawpaw fruit to grow, its flower must be pollinated from a separate grove of pawpaws.



Liz Shippam

Blackthorn

Prunus spinosa

Watercolor on paper

12 x 9 inches



Jane Hancock

Wild Plum

Prunus americana

Watercolor on paper

13 x 16 inches

There are many plums such as *Prunus americana* that are native to North America. While many are upright trees, others creep along the ground like *Prunus pumila* var. *depressa* 'Catskill'. Known as eastern sand cherry, this shrub has a deep, dense root system far more extensive than its spreading branches. This root system makes this cultivar a stabilizer along riverbanks and streambanks, such as the Delaware River that cuts through the Catskill Mountains. It produces small white flowers with yellow centers in spring.



Juror's Work

Denise Walser-Kolar

Roxbury Russet Apple

Malus domestica 'Roxbury Russet' x 2

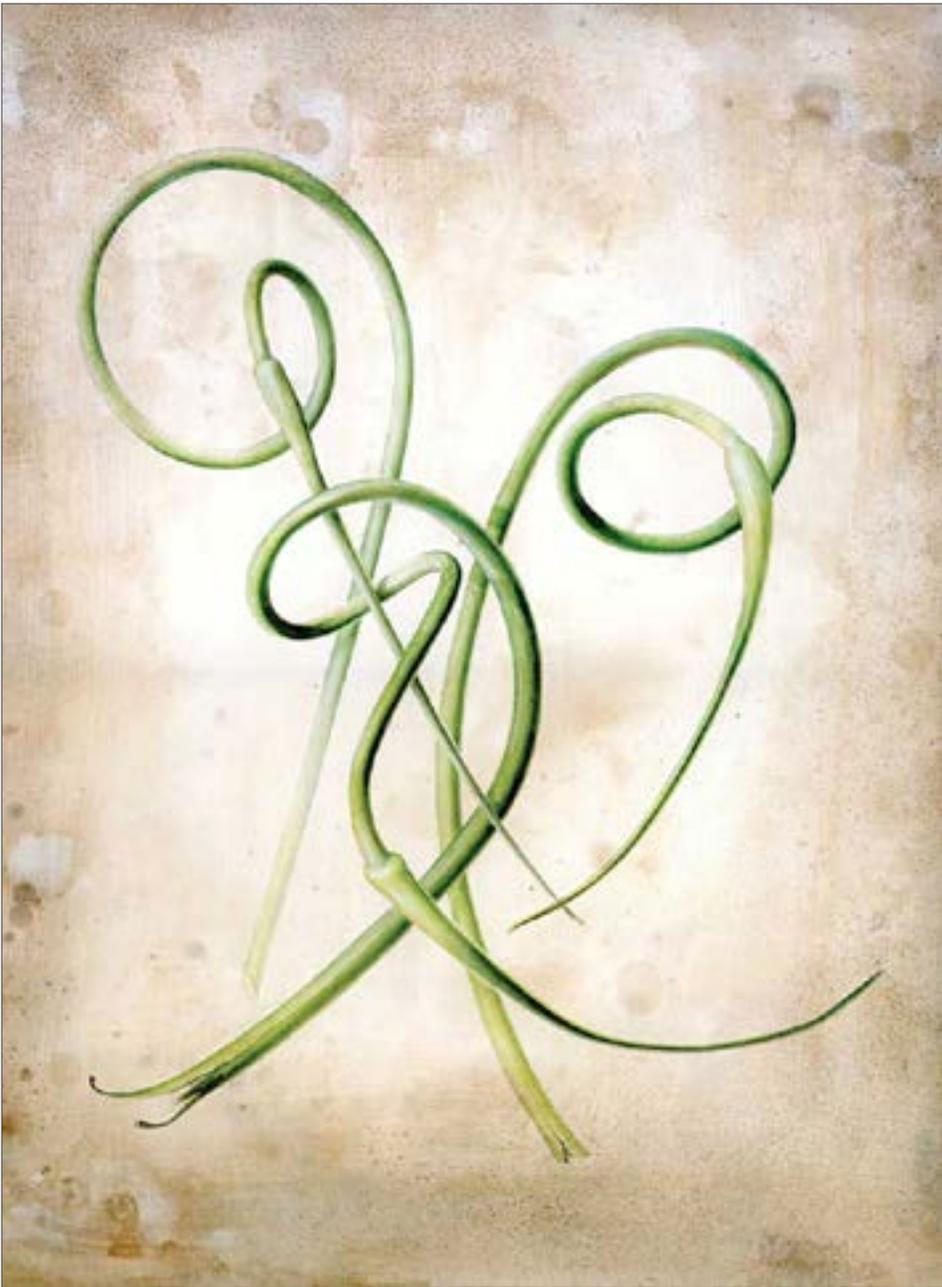
Watercolor on vellum

10 x 9 3/4 inches

Garlic and Onions

Garlic contains **allicin**, a sulfur compound that is part of the plant's defense against pests that is released when it is crushed and is responsible for the bulb's strong flavor and scent. In humans, evidence suggests that allicin may help lower cholesterol and blood pressure and has been associated with a decreased risk for some cancers. However, some studies suggest that large quantities of garlic, or supplements that contain allicin, can interfere with blood clotting, so doctors advise against taking garlic supplements or eating large quantities before surgery. Garlic powders and oils do not appear to have the same medicinal properties as whole garlic. To gain potential benefits from garlic, buy whole cloves and incorporate them into your cooking. Garlic, one of the most popular plant-based cooking ingredients, is used in many dishes and cuisines worldwide.

Garlic, onions, leeks, chives, and shallots are all part of the *Allium*, the only genus in the Allieae (allium) subfamily within the Amaryllidaceae (amaryllis) family. *Allium* is derived from the Greek word for garlic, and this genus has been an important group of plants for thousands of years. It was first described in 1753 by Carl Linnaeus, who developed the two-part plant naming system we recognize today.



Kathy Schermer-Gramm

Porcelain Hardneck Garlic Scapes

Allium sativum

Watercolor on paper

14 x 11 inches

How to grow garlic



Gillian Rice

Tohono O'odham l'ittoi Onion

Allium cepa

Watercolor on paper

17 x 11 inches

Onions add wonderful flavor to many dishes, but did you know that they can also add spectacular color to gardens? In summer, along our Daylily/Daffodil Walk ornamental onions produce bright-purple orbs that line the pathway. **Check out some of our favorite ornamental onions**

Berries

Did you know bananas are berries? And did you know strawberries are not berries? Other common botanical misnomers are raspberries and blackberries. Botanically, berries are formed from the ovary of a single flower. When pollinated, the ovary begins to develop flesh around it and the seeds mature. Pollination occurs when the ovules of a plant are exposed to pollen from the male element (**anther**) of the plant. While berry-bearing plants do not fit neatly into a single genus or family, they are collectively considered bacciferous or baccate.



Linda Powers

Poorman Gooseberries, Utah 1888

Ribes uva-crispa 'Poorman'

Watercolor on vellum

13 1/4 x 10 inches



Constance Scanlon

Heirloom Blueberry Branch # 1
Vaccinium corymbosum 'Stanley'

Watercolor on vellum

9 x 10 inches



Betsy Rogers-Knox

Wild Fox Grapes

Vitis labrusca

Watercolor on paper

16 x 21 inches

There are hundreds of varieties of grapes, wild and domesticated, such as pinot noir or cotton candy, and also the Bronx grape. The Bronx grape was domesticated in 1930s by a New York Botanical Garden scientist, Dr. Arlow B. Stout, who partnered with Cornell University's New York State Agricultural Experiment Station to make a seedless, tasty, and hardy grape. Today you might find the descendants of the Bronx grape among the seedless grapes at your local grocery store.

Seedless Grapes, With Roots at NYBG

Salad Days

The rainbows of the plant world, radishes and swiss chard capture the whole spectrum of color. They are also entirely edible. Yes, you can eat the radish greens and the multicolored stems of chard! We grow swiss chard and radishes of all shapes and sizes in the Edible Academy, capturing the diversity of radishes around the world. In cooking, radish greens and swiss chard are considered tender greens rather than kale and collard greens, which are hearty greens. Tender greens cook down faster in warm dishes similar to spinach.

Our Edible Academy has developed many recipes incorporating the harvest from the planting beds.



Mitsuko Schultz

Swiss Chard

Beta vulgaris 'Ruby Red'

Watercolor on paper

15 1/2 x 11 1/2 inches



Sengmany Phommachakr

Radishes

Raphanus raphanistrum subsp. *sativus*

'Watermelon', 'French Breakfast', 'Black Spanish Round'

Watercolor on paper

20 x 12 3/4 inches



Beverly Duncan

Garden Tangle

Raphanus sativus 'De 18 Jours'

Watercolor on paper

16 1/2 x 19 inches

Tropical Delicacies

The tropics are generally understood as regions north and south of the equator between the Tropics of Cancer and Capricorn. The tropics encompass many different habitats. While coffee grows in **upland rain forests**—rain forests at higher altitudes, with slightly cooler temperature ranges—*Pandanus* grows along wind-whipped ocean shorelines, and vanilla orchids thrive in the heat and humidity of lowland rain forests. Several New York Botanical Garden scientists study areas in the tropics such as Vanuatu in the South Pacific. **Learn more about our work in Vanuatu.**



Carol Woodin

Vanilla Orchid

Vanilla planifolia

Watercolor on vellum

14 x 9 3/8 inches



Mariko Ikeda

Jorum Pandanus

Pandanus tectorius 'Jorum'

Watercolor on vellum

28 5/32 x 23 15/32 inches

Mariko Ikeda

Jorum Pandanus

Artist Story

Pandanus tectorius 'Jorum' is an important food on Pacific islands, particularly the Micronesian atolls. It contains high levels of carotenoids and vitamins, and provides further health benefits. Cultivars have been selected through time to produce a large, sweet fruit. Those unsuitable for human consumption were discarded. *Pandanus* has traditionally been planted along the seashore with the dual purpose of providing nutrition and preventing soil erosion. However, recent years have seen a rise in concern regarding people leaving the atolls and a loss of traditional culture due to the modernization of lifestyles. The cultivation of *Pandanus* is also feeling these effects. *Pandanus tectorius* itself is not rare, but its use for human consumption outside of the atolls is limited. It is for this reason that I believe we can discover unique values in the abundant range of cultivars that serve as evidence of uninterrupted cultural practice.



Sarah Howard

Ethiopian Limu Coffee

Coffea arabica

Watercolor on paper

13 7/8 x 14 1/4 inches

Non-Edible Plants

Inedibility does not make plants any less significant. Raffia palm, which is native to the tropical regions Central and South America, is known for its long leaves. Some of the longest in the plant kingdom, they can reach over 80 feet long. *Raphia taedigera* is noted for the fibers that the veins of its leaves produce. These fibers are used for ropes, baskets, and other woven products. The palm is **monocarpic**—after it flowers and produces fruit, it dies—and the fruit it produces gives the palm its other common name, pine cone palm.



Barbara Ozeerally

Seedheads of Raffia

Raphia taedigera

Watercolor on paper

19 x 11 inches



Susan Tomlinson

Early Cotton

Gossypium herbaceum

Watercolor on paper

12 x 9 1/2 inches