WINTER 2010 THE BOOKS THAT BIND CENTERS FOR WOMEN 35TH ANNIVERSARY SMALL CHANGE, BIG CHANGES

Wellesley

WHERE SCIENCE TAKES ROOT

THE MARGARET C. FERGUSON GREENHOUSES

WINTER 2010

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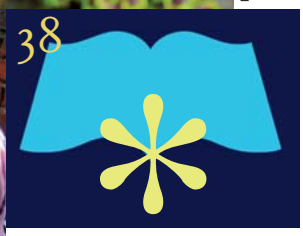
'I think of [the Margaret C. Ferguson Greenhouses] as a low-hurdle introduction to science. You come in here and get curious about these cool plants, and that curiosity is what will propel you to the next step, to start asking questions.'

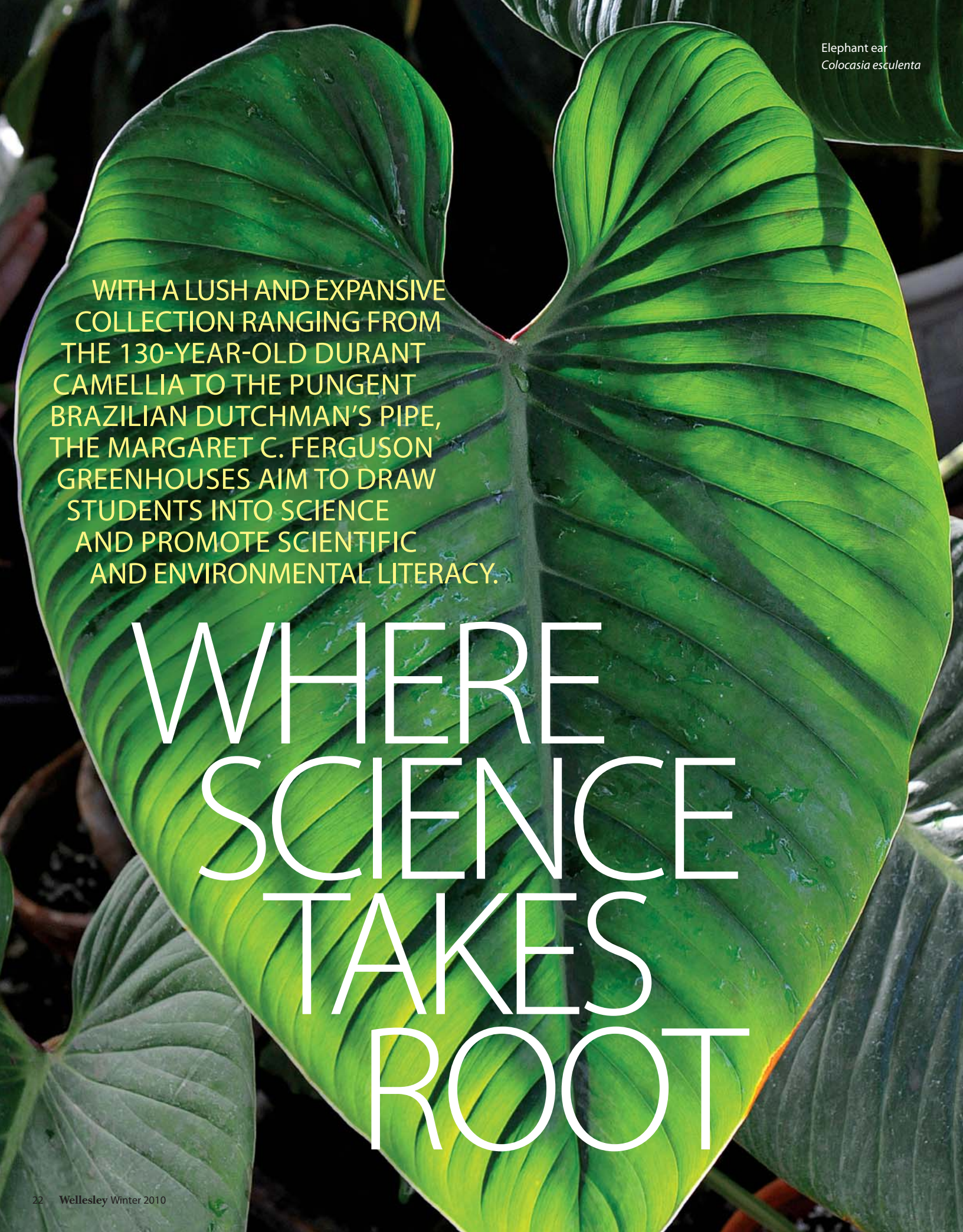
—Kristina Jones, director of the Wellesley College Botanic Gardens

Cover photograph of bird of paradise and tree frog and photograph above of the Mabel A. Stone Cryptogam House shot in the Margaret C. Ferguson Greenhouses by Richard Howard

RICHARD HOWARD

MERCEDES BENAVIDES '83





Elephant ear
Colocasia esculenta

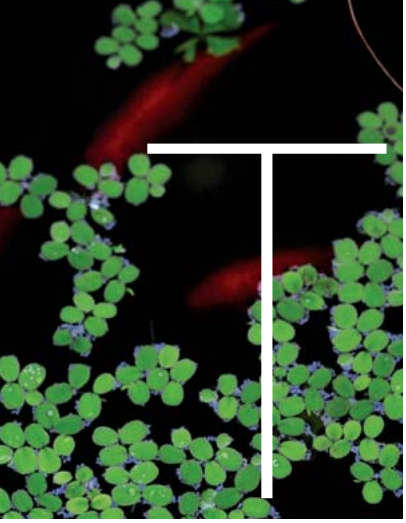
WITH A LUSH AND EXPANSIVE COLLECTION RANGING FROM THE 130-YEAR-OLD DURANT CAMELLIA TO THE PUNGENT BRAZILIAN DUTCHMAN'S PIPE, THE MARGARET C. FERGUSON GREENHOUSES AIM TO DRAW STUDENTS INTO SCIENCE AND PROMOTE SCIENTIFIC AND ENVIRONMENTAL LITERACY.

WHERE SCIENCE TAKES ROOT

The vegetation of the Tropical House transports visitors to the humid zones of the tropics.

TEXT BY JENNIFER MCFARLAND FLINT

PHOTOGRAPHS BY RICHARD HOWARD



Tucked up under the northeast side of the Science Center, the Margaret C. Ferguson Greenhouses function, in some ways, as an offshoot of their towering neighbor—offering an opportunity to explore a science-based understanding of the world. But it's a gentler introduction than, say, organic chemistry: "I think of this as a low-hurdle introduction to science," explains Kristina Jones, the director of the Wellesley College Botanic Gardens. "You come in here and get curious about these cool plants, and that curiosity is what will propel you to the next step, to start asking questions."

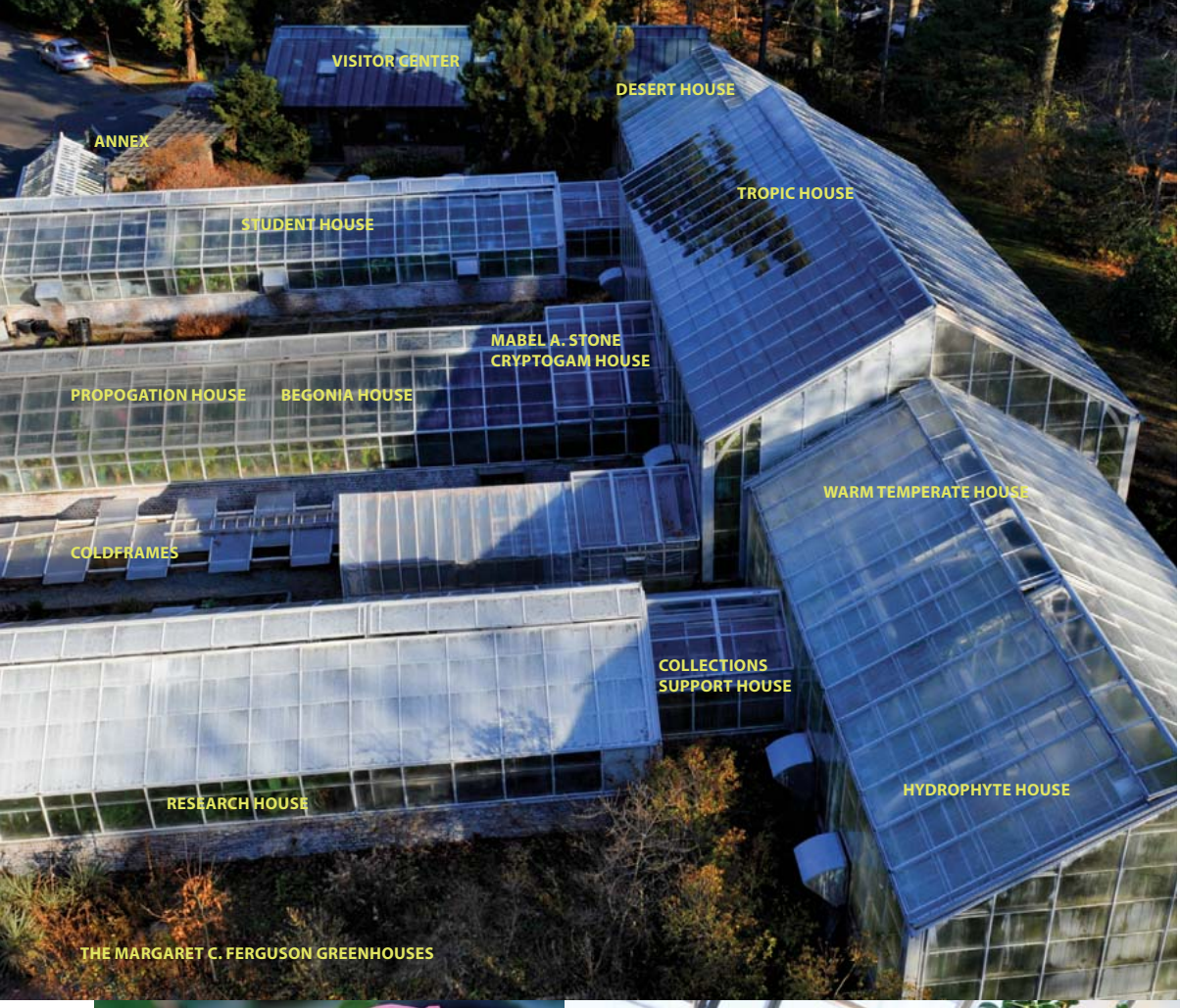
Wellesley's greenhouses contain the most diverse collection of plants under glass in the Boston area—and are a standout collection among other colleges and universities. Given the richness of opportunities here, academic departments from math to arts, anthropology to languages, have used the living collections as a teaching tool. So much so, says Jones, that the greenhouses serve the campus as a "parallel resource to the Davis Museum." It's a fitting description, because the sights inside are every bit as moving as a work of art.

The greenhouses' roots, if you will, can be traced back to Henry Durant's personal passion for botany: The founder of the College had an impressive collection of his own, which he made available to student use. In 1920, the College Trustees designated 22 acres of the campus for use as a botanic garden, and the greenhouses were completed in 1925. Margaret C. Ferguson, a faculty member for several decades who designed the greenhouses (and who became the first woman president of the Botanical Society of America in 1930), spelled out the vision: "It is our purpose that the department shall stand, primarily, in the future as in the past, for the dignity and educational value of its scientific work. At the same time we shall not fail to emphasize the humanistic aspects of our subject; and we shall endeavor to form a center that shall be of interest to all." That vision, translated into today's mission, is to increase participation in science and promote scientific and environmental literacy.

Shrimp plant
Beloperone guttata

Kristina Jones, left, director of the Wellesley College Botanic Gardens, which includes the greenhouses

*(Top left) Goldfish in the Hydrophyte House swim amid the salvinia (*Salvinia minima, *also known as water spangles).*



7,490
SQUARE FEET UNDER GLASS

600
ROUGH NUMBER OF SPECIES REPRESENTED

3
NUMBER OF RESIDENT TREE FROGS

BOTANY 101

At least 130 years old, the Durant Camellia *(above and right)* was a gift from Wellesley's founder himself, one of four camellias he gave to the College from his personal collection. Two went up in flames inside College Hall in 1914, and the third was removed from the greenhouses at some point. This last known survivor has struggled with various diseases over time and has been "very difficult to propagate," according to Jones. (The staff tried repeatedly, but without success, to grow a cutting for former President Diana Chapman Walsh '66 upon her retirement.) No one knows the origin of the cultivar; the variegation of these flowers is caused by a virus, making each one unique. The virus affects the expression of pigment: The affected cells don't produce pigment, while the unaffected cells remain red.

Durant Camellia
Camellia japonica

Beyond a seasonal display space lies a closed area for student research and plant cultivation.

THE GREENHOUSES SERVE THE CAMPUS AS A 'PARALLEL RESOURCE TO THE DAVIS MUSEUM.'

—Kristina Jones, director, Wellesley College Botanic Gardens

IN AN ATTEMPT to entice students early on, the greenhouses invite first-years to pay a visit and take plants (propagated in the greenhouses, of course) back to their dorm rooms as souvenirs. "We're trying to get them to explore what's here and hopefully come back," says Jones.

When they do, they can engage with the greenhouses' resources in a variety of ways: first and foremost with its diverse plant collection, but also with the online collections database and the extensive historical archives. The propagation house has a sand-filled bench where students can practice taking leaf or stem cuttings; two research houses are closed to the public and set aside for student and faculty research and experimentation. Courses in the physical and natural sciences make use of the collections' diversity; those studying book arts harvest the greenhouses' papyrus and make paper from it; and the environmental-studies program has teamed up with the greenhouses and botanic gardens to explore mutual interests in botany and sustainable agriculture.

In addition, the botanic gardens and greenhouses have been cultivating a new focus on the role of plants as food—for humans, insects, birds, and other animals. As a collections priority, this translates to growing specimens that are fairly forgiving of an occasional munch, rather than horticulturally perfect specimens that demand more human attention and the use of pesticides. The greenhouses now feature plants that are used for both nutrition and medicine all over the world, creating opportunities to study human cultures, agriculture, related sciences, and their intersections with botany.

This new focus also provides

400

NUMBER OF PLANTS GIVEN AWAY TO FIRST-YEAR STUDENTS EACH YEAR

10

NUMBER OF (INDOOR) HOSES USED FOR WATERING

62

NUMBER OF GROUP TOURS GIVEN LAST YEAR

Coleus cultivars on a propagation bench will be used in a horticulture class.

Darwin's Orchid
Angraecum sesquipedale

BOTANY 101

When Charles Darwin saw this species of orchid, native to Madagascar, with its spur measuring up to 12 or 13 inches, he predicted that there must be a moth with a proboscis long enough to reach the nectar at the tip of the spur, thereby pollinating the flower. His hypothesis was scorned. But 21 years after Darwin's death, the hawk moth (*Xanthopan morganii praedicta*), with its bizarrely long tongue, was discovered—and the theory confirmed. The species is now commonly known as Darwin's Orchid (*Angraecum sesquipedale*).

an opportunity to lure students in for study breaks. The last such event was a light show called "The Spice of Life," where the greenhouses were theatrically lit with spotlights calling attention to a variety of spice plants. The staff provided cool facts about the plants, samples to smell and touch, and spiced cookies and rice to taste. With no disrespect to students, there is perhaps no better way to lower the hurdle to science than to create theater out of botany and offer students a chance to fill their bellies—and their minds.

SPOTLIGHT

THE DESERT HOUSE

WALKING THROUGH the greenhouses' permanent collections is like globe-trotting, writ small: The main houses mimic various climate zones—the desert, tropics, and subtropics—each with its own array of color, texture, scale, and pattern. Visitors first enter the Desert House, with its collection of plants from different families, all of which have adapted to surviving in desert conditions.

These species are bursting with lessons not only in biological form and function, but also in mathematics. The arrangement of leaves on a stem (or phyllotaxy), for example—whether spiral or alternate, opposite or whorled—conforms to distinct mathematical patterns. "The stem will have a bud in the middle, and the plant puts the next leaf where there's the most room," explains Jones. "That turns out to be a constant angle away from the previous one, and it results in the minimum overlap of the leaves shading each other. So you wind up with a spiral pattern going down the stem. For some plants that have their leaves close together, it winds up looking like a flower. Nature has perfected so many of these rules because they minimize the materials needed to make the structure."

Another lesson in the Desert House, more subtle than the dramatic spirals, is the phenomenon of convergent evolution, whereby species of different lineages acquire the same biological traits or form. Take the cactus family as compared to other succulents, like euphorbia, for example: A true cactus originates in the Americas, whereas other succulent species are from other deserts in the world, particularly Africa. To the untrained eye, the physical differences of these plants might be indistinguishable. "That's because they have converged on similar solutions to environmental problems," in this case water storage, Jones explains. If the differences seem too subtle: "Flowers are good indicators of who you're related to," says Jones. "Cactus flowers tend to be big and showy, in attempt to attract pollinators like bats and bees in the desert, whereas euphorbia flowers are totally different. Less showy and dramatic."

BOTANY 101

Caudiciforms (including, below, a Socotran fig) are a general grouping of differing families of plants that show convergent evolution. Unrelated plants from dry habitats around the world have evolved a swollen caudex (where the stem meets the root) for water storage. Some, such as baobab trees, are important sources of water for people.

A Desert House landscape

Socotran fig
Dorstenia gigas

For a virtual tour of the greenhouses' rooms—and to see samples of the plants growing there—visit http://www.wellesley.edu/WCBG/Visit/Tour/greenhouse.html/.

Zebra haworthia
Haworthia fasciata

Jungle snow
Erythrorhipsalis pilocarpa

108.5 oz.
PESTICIDE USAGE IN 2003

9.5 oz.
PESTICIDE USAGE IN 2009

100,000 +
NUMBER OF BENEFICIAL INSECTS RELEASED EACH YEAR

Polish old-man cactus
Austrocephalocereus dybowskii

Ghost plant
Graptopetalum paraguayense

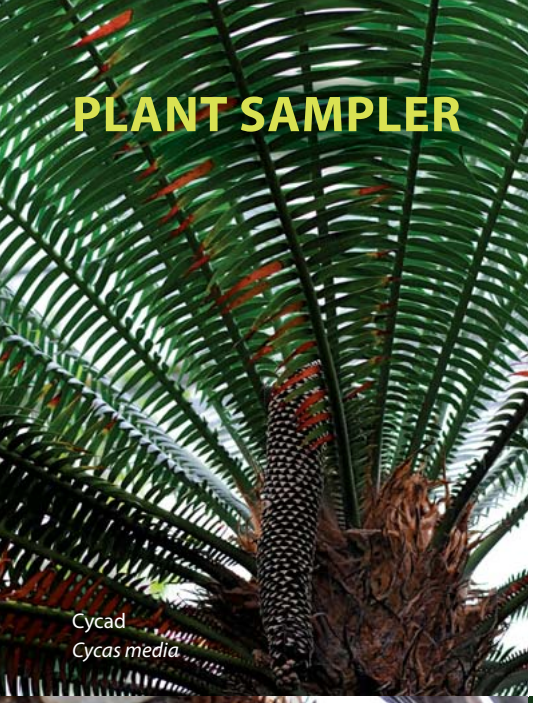
Lemon ball cactus
Parodia leninghausii

Old-woman cactus
Mammillaria hahniana

Caudiciform collection

Golden barrel cactus
Echinocereus grusonii

PLANT SAMPLER



Cycad
Cycas media

7

NUMBER OF CARNIVOROUS SPECIES

13 FT.

SIZE OF THE BIGGEST LEAF (FAN PALM)

1 MM.

SIZE OF THE SMALLEST LEAF (DUCKWEED)

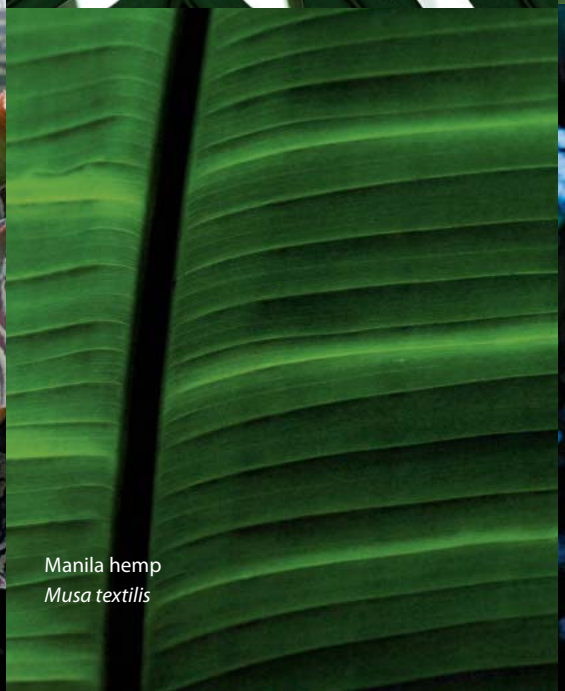
Umbrella sedge
Cyperus involucratus

Hairy-eyeball plant
Philodendron bipinnatifidum

Swiss-cheese plant
Monstera deliciosa

Jungle cactus
Rhipsalis houlletianum

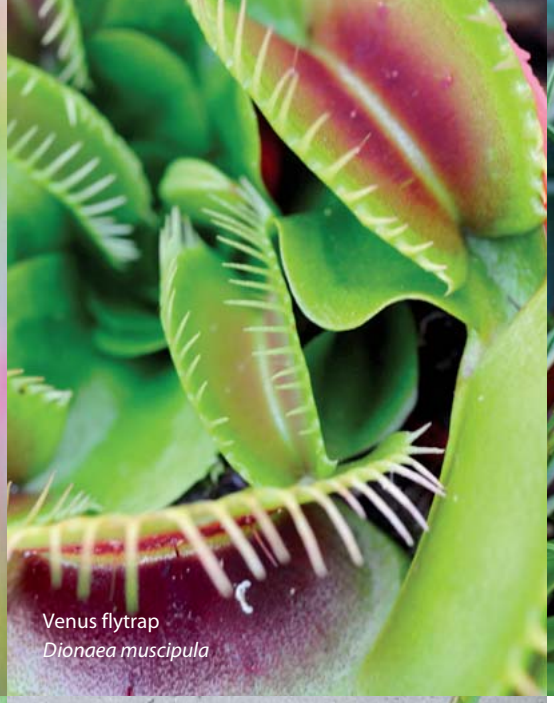
Earth star
Cryptanthus zonatus



Manila hemp
Musa textilis

Giant dioon
Dioon spinulosum

Dana's delight (pitcher plant)
Sarracenia hybrid



Venus flytrap
Dionaea muscipula

Pink quill
Tillandsia cyanea

Scarlet belle (pitcher plant)
Sarracenia hybrid

Banana
Musa acuminata

GREEN ESCAPE

ANYONE INTERESTED in the science or artistry contained in the Margaret C. Ferguson Greenhouses (as well as anyone just looking for a little climate escapism) is welcome to visit every day of the year between 8 A.M. and 4 P.M. Friends of Horticulture offers free tours for groups of eight or more, with advanced notice, as well as courses on watercolor and botanical art, and a new certificate program in botanical art and illustration.

For more information,
visit http://www.wellesley.edu/wcbg
or call 781-283-3094.

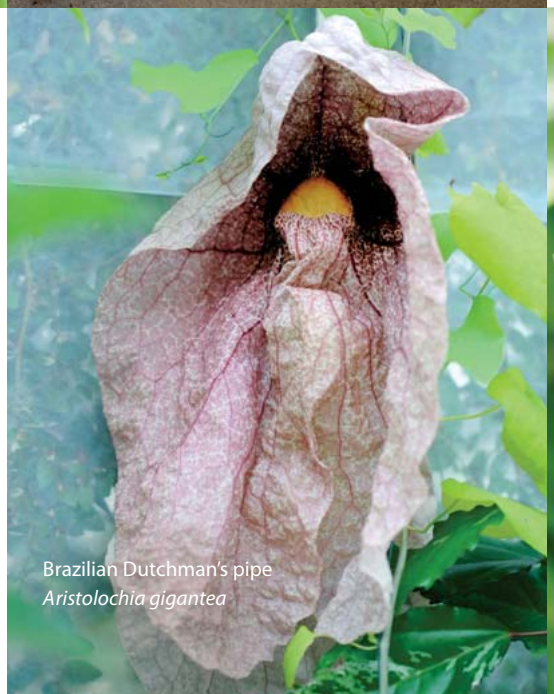
Jennifer McFarland Flint, a former associate editor of Wellesley *magazine, is a freelance writer based in Somerville, Mass.*

BOTANY 101

Cycads *(opposite page, bottom right)* are a primitive species that were commonplace during the Mesozoic era, 65 to 225 million years ago. The cycad is not technically a tree, as it lacks true wood, but the accumulation of old leaf bases gives the plant its trunk structure. "These plants wear their history," Jones says, referring to the scars that accumulate up and down the trunk, marking injuries or events in the plant's development.

BOTANY 101

The Brazilian Dutchman's Pipe (*Aristolochia gigantea*), *right,* produces a flower 12 to 16 inches wide that looks and smells like carrion. The stench attracts flies, which prefer to lay their eggs in the most dank, putrid real estate they can find. "So the flies find their way into the flower's dark pouch, which is where the reproductive parts are," says Jones. "Then they pollinate the flower, fly out, and look for the next one." It truly takes all kinds to make a world.



Brazilian Dutchman's pipe
Aristolochia gigantea

Hybrid Orchid
Zygopetalum x