



seek and find medicinal plants

How many of these plants can you find? You can discover more about these plants by reading the signs throughout the *Climatron*®.

Find the **neem** tree. The neem leaf and seed have many uses. They help slow certain diseases and germs. What insect pest can its leaves and seed oil repel?

Kapok is a valuable tree in many tropical countries. It provides wood, oil, and food. Many people think that it is a sacred tree because of its great size. How tall can it grow?

The **curare vine** is used by native tribes in the Amazon. They make a plant mixture called curare. How do they use this mixture for hunting?

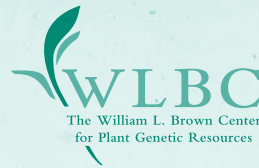
Most parts of the **powder-puff tree** are used medicinally. Some people use it to help treat coughs and chicken pox and to relieve pain. Why do you think the tree often lives near water?

Turmeric is used by some people to help clean and heal wounds. It is also used in a spice called curry powder. Turmeric gives curry what color?

The **nutmeg** plant provides two valuable spices, nutmeg and mace. These two spices are used in sweet puddings, cakes, pies, and in medicines. What part of the plant does nutmeg come from?

how many can you find?

___ Pineapple ___ Birthwort ___ Lime
___ Banyan tree ___ Wild plum



Plants provide humankind with our most basic resources—food, medicine, fiber, and many other useful products. The Missouri Botanical Garden's William L. Brown Center for Plant Genetic Resources (WLBC) is dedicated to the study, description, and conservation of useful plants—and to preserving traditional knowledge about these plants for a sustainable future.

The Missouri Botanical Garden is home to one of the largest international programs in botanical research and conservation in the world. From traditional plant use in Missouri to medicinal and food plant species in the Andes, Himalayas, and African highlands, the WLBC builds on the Garden's expertise to ground the study and conservation of useful plants in rigorous science. Learn more about the WLBC at www.wlbcenter.org.

MAKE A DIFFERENCE

At present rates, half of the world's estimated plant species will be extinct by the end of the century. Endowed positions enable the Garden to commit to long-term conservation projects ensuring the positions required to carry out this mission are permanently supported. To learn more about the opportunities for endowing curatorial positions at the Garden, contact the office of Institutional Advancement at (314) 577-9500.

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MEDICINAL PLANTS



The Climatron® Conservatory

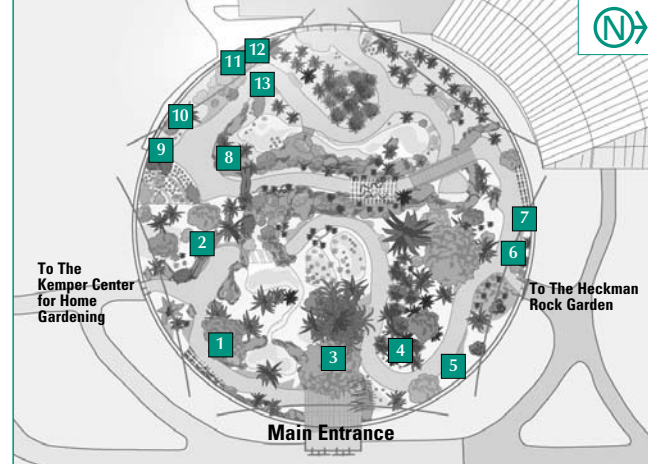


new inside →

 MISSOURI BOTANICAL GARDEN

MEDICINAL PLANT TOUR

Welcome to the medicinal plant tour of the Climatron® rain forest conservatory. The tropics are an evolutionary powerhouse—the most diverse ecosystem on the planet. Tropical plants account for 160,000 of the earth's estimated 300,000 species of plants. Less than 2 percent have been thoroughly tested for medical applications, and yet 25 percent of our prescription medicines derive from plants.



medicinal plants

For most of human history, plants and a few fungi were the only medicines. People discovered medicinal plants just as they discovered edible and poisonous plants: by trial and error; that is, by tasting them to see what happened! Local medicine chests have been developed over centuries of use and experimentation.

Plant-based medicines are often less potent than modern drugs, but studies prove many to have real value. Some do not, however, and a few are so toxic that they may do more harm than good. Because research facilities are limited, most locally used plants have never been studied at all. Over four billion people in developing countries rely on traditional medicines. They often cannot be sure whether a medicine is safe or effective.

Conservation of medicinal plants is very important, partly because many have not yet been studied. If these plants become too rare or expensive, however, people in the developing world may lose access to their primary medicines. The Garden supports conservation, economic development, and education programs in tropical countries. One goal of such programs is to help people use plants and other natural resources sustainably, so they continue to be available in the future.

inside the climatron

1. POWDER-PUFF TREE (*Barringtonia racemosa*) grows in mangrove forests. It contains compounds that might fight cancer.

2. KAPOK (*Ceiba pentandra*) is a sacred tree in Africa. It provides wood, oil, food, insulation, and medicinal bark.

3. BANYAN (*Ficus benghalensis*) bark lowers blood sugar and is used to treat diabetes.

4. WILD PLUM (*Harpephyllum caffrum*) is used in South Africa for conditions including acne and eczema.

5. NEEM (*Azadirachta indica*) is an Indian tree that fights bacteria, viruses, fungi, lice, and even cancer. It may also prevent pregnancy.

6. BIRTHWORTS (*Aristolochia* species) were valued as medicine but had a hidden danger. When taken chronically, they can cause kidney failure.

7. LIME (*Citrus × aurantiifolia*) juice is used in many tropical countries for respiratory infections.

8. TURMERIC (*Curcuma longa*), the main spice in curry powder, may reduce cancer risk.

9. PINEAPPLE (*Ananas comosus*) contains compounds that relieve inflammation and swelling.

10. CURARE VINE (*Chondrodendron tomentosum*) is the source of a muscle relaxant that used to be used in surgery.

11. QUININE TREE (*Cinchona pubescens*) bark treats malaria and is the source of the antimalarial drug quinine.

12. GINGER (*Zingiber officinale*) relieves motion sickness and morning sickness.

13. NUTMEG (*Myristica fragrans*) is used to treat viral diarrhea.

drug discovery

Many modern drugs are derived from complex molecules in plants, fungi, and bacteria. Some are chemically altered to make them stronger. Sometimes they can be made synthetically. The drugs could not be made before the natural compounds had been discovered, however. For many years, the Garden has provided plants for natural product discovery programs, which search for compounds that might become drugs.

Medicinal plants are especially likely to contain useful molecules. For example, goat's rue (*Galega officinalis*) is traditionally used for diabetes. The diabetes drug metformin was derived from a compound in goat's rue. Other common drugs derived from plants include aspirin, codeine, and digitalis. Drugs allow more precise dosing, so drugs made from poisonous plants (such as foxglove, the source of digitalis) are safer than using the plants themselves.

Some useful botanical medicines cannot readily be made into drugs. Other plants contain molecules that only become useful as drugs. For example, cancer drugs like vincristine and topotecan come from plants that don't cure cancer. We cannot know in advance which species could provide lifesaving drugs.

Whenever a species goes extinct, we might be losing a cure for cancer or AIDS.

Disclaimer: This brochure is intended as an introduction to medicinal plants of the Climatron®. It is for educational purposes only. The Missouri Botanical Garden makes no claims to the medicinal effects of these plants. In fact, plants may be harmful or even deadly if taken for the wrong conditions, used in excessive amounts, or combined with other drugs. Consult your doctor about your health conditions and the use of plant-based remedies.