

received
FEB 11 1997

FNE96-144

**AN EVALUATION OF CHINESE MEDICINAL HERBS
AS FIELD CROPS IN THE NORTHEAST**

January 31, 1997

*A report submitted to the Northeast Region Sustainable
Agriculture Research and Education Program (SARE),
Farmer/Grower Grant Program, 10 Hills Building, Carrigan
Drive, University of Vermont, Burlington VT 05405-0082*

Marnie and Don MacLean
Thompson-Finch Farm
750 Wiltsie Bridge Road
Ancram, NY 12502
518-329-7578

Jean Giblette and Laura Smith
High Falls Gardens
P.O. Box 778
Philmont, NY 12565
518-672-7365
Email LSMITH.HFG@worldnet.att.net

*AN EVALUATION OF CHINESE MEDICINAL HERBS
AS FIELD CROPS IN THE NORTHEAST*

TABLE OF CONTENTS

	<u>Page</u>
I. Executive Summary	1
II. Objectives	2
III. Methods	2
IV. Results	3
V. Outreach	5
VI. Discussion and Conclusion	5
VII. Recommendations	7

Exhibits

- A. List of Category A Plant Species
- B. List of Category B Plant Species
- C. List of Category C Plant Species
- D. Species in Field 1996 Season
- E. Primary Reference Texts

I. EXECUTIVE SUMMARY

In China, many medicinal plants are cultivated, harvested, dried and otherwise minimally processed, then combined by skilled practitioners according to established formulas for human consumption. These ancient arts are extremely sophisticated and well-documented, and are in the first stages of replication or adaptation in the West.

A small group of farmers and herbalists in the Hudson River Valley region have created a garden of Chinese medicinal plants. In 1996 they were given a one-time opportunity to add a large number of plant species to the garden and appealed to the Northeast Region SARE Grower Grant Program for funding to realize this opportunity. A collector of Asian medicinal plants in San Francisco was planning to close his operation and give his plants and seeds to a few responsible growers.

With the assistance of the SARE grant, the collector, Robert Newman, shipped 695 batches of seeds and/or plants to the herbalists, Jean Giblette and Laura Smith of High Falls Gardens, who assisted the farmers, Marnie and Don MacLean, in germinating seeds and planting the garden at the Thompson-Finch Farm, Ancram, New York. The group used best efforts to add as many different species as possible during the 1996 season and to document and evaluate the results. The outcome was that the number of species grown in the field increased from 35 to 120, with an additional 176 species maintained as indoor plants or seeds in inventory. Seed was collected from 48 species during the season; photos and slides were taken to document the project and for purposes of outreach education.

To evaluate this abundance, the group enlisted the services of a consultant, Jeffrey C. Yuen, who helped them determine which of the species are potentially marketable to practitioners of Chinese herbal medicine. The plant species were divided into three categories: (1) potentially marketable with favorable prospects for cultivation in the Northeast; (2) potentially marketable but cultivation appears problematic for various reasons; (3) not as desirable or marketable. The last category includes many "secondary" species; as many of the herbs have not been cultivated for medicinal purposes in the West, it is not yet known precisely which species of a closely-related group has the best potential to serve as the medicinal remedy. Therefore, plants of the third category are not necessarily of a lower value or priority.

In this report, all 296 plant species are listed according to evaluation category, along with basic information including Chinese (Pinyin) remedy name, common name, herbal properties (nature, treatment strategy and organ system affinities), cross-references to three texts, taxonomic family, comments (related species, zone information, etc.), and original source(s) of seed or plants.

The materials received from Mr. Newman represent a significant resource for farmers/growers in the Northeast. Obtaining appropriate plant materials is only the first step in a complex process to develop a market for the remedies, and much more remains to be done. However, growers in the Northeast can now participate in a more widespread effort to take advantage of this developing market.

II. OBJECTIVES

A garden of Chinese medicinal herb species had been planted on the Thompson-Finch Farm in Ancram, New York in May of 1995 as a collaboration between Don and Marnie MacLean, the farmers, and Jean Giblette and Laura Smith of High Falls Gardens, the herbalists.

In 1996 a unique opportunity arose to add substantially to the varieties under cultivation. A collector, Robert Newman, curator of the Asian medicinal plant collection affiliated with the American College of Traditional Chinese Medicine in San Francisco, decided to shut down his operation and to disperse the plants and propagation materials to a small number of responsible herbalists throughout the country, including High Falls Gardens.

- **Cultivation Data**

With the support of the SARE program, the farmers and herbalists decided to use Mr. Newman's material to germinate and plant as many species as possible during the 1996 growing season, to take note of which plants thrived, and to get a preliminary understanding of which species had potential to do well as field crops in the Northeast.

- **Marketing Data**

The herbalists have studied since 1994 with Jeffrey C. Yuen, director of the Chinese medicine program at the Swedish Institute in New York City. Mr. Yuen is involved in teaching the use of herbs to licensed acupuncturists as well as to students of Chinese medicine at all levels. He agreed to consult with the project, primarily to evaluate which of the species under consideration would be of interest to herbalists, acupuncturists and other practitioners who work in the New York City area, which represents the largest concentration of practitioners in the Northeast. Thus, the material would undergo a preliminary assessment for its marketing potential as well.

- **Outreach Education**

A third objective is to inform other growers in the Northeast of the project, to increase awareness among this group of Chinese herbal medicine and the herb species involved, and to disseminate the results of the project.

III. METHODS

The herbalists and farmers assumed in advance that shipments of plant materials from Mr. Newman would be received in the spring of 1996. In fact, more than 20 shipments occurred from February through September of 1996, consisting of a total of 695 separate packets of seeds or groups of small plants. Each separate packet or plant was assigned a batch number.

A portion of each seed batch received from February through May was planted, and a record kept of germination rates. Plants were maintained in the greenhouse until Memorial Day and

then planted in the field. Plants received later in the year were either kept indoors or planted in a special nursery bed to winter over.

- **Germination**

Certain seeds (though not many, due to the quantity of batches received) were presoaked for 24 hours in a kelp/camomile infusion or were nicked or perforated to enhance germination. All seeds were sown in flats and stored in a heated box (70-80° F) for one to four weeks and monitored periodically. If the heat box failed to achieve results, flats were stored outdoors in a shaded area and watered consistently.

- **Cultivation**

In a field with a gentle slope to the southwest, the farmers created raised beds of earth four feet wide by 200 feet long. A cover crop of ryegrass was planted between the beds. After the plants had grown sufficiently, beds were mulched with straw. Plants were marked individually with plastic stakes and later with metal stakes for each group of plants. Beds and rows were hand-weeded; because of wet conditions resulting in prolific growth, weed control was inadequate.

- **Harvest and Storage**

Harvesting of seed occurred from August into November. No other samples of plant fractions were taken this year. Seeds are stored by batch number in airtight containers with a desiccant and kept for the winter in a dry cellar at 50°F.

- **Documentation**

The herbalists created a relational, electronic database (Paradox 4.0 on a PC) of all plant species linked to batch number. Variables include Chinese (Pinyin) remedy name, common name, family, cross-reference to the three main texts, herbal properties, organ system affinities, source of batch, date of receipt/planting, outcome and miscellaneous comments. At year end, this database incorporates 378 species and 874 batch numbers. Exhibits A, B, C and D of this report were generated from the database.

Photos and color slides of plants were taken to document the season's work, to help confirm species identification and for purposes of outreach education. As of this date, there are approximately 50 slides organized into a collection suitable for presentation.

IV. RESULTS

As presented in Exhibit D, 120 species were grown in the field in 1996. Exhibit D does not include plants germinated or received late in the season; these are now stored indoors or in a winter nursery bed. In addition, efforts to germinate a number of species are still continuing and a large inventory of seed still exists. The total number of species grown in the previous

season was 35; hence, the material received from Mr. Newman enabled the project to substantially increase the number of species grown as well as seed in inventory.

These 120 species include only approximately 35 that are annuals or could be grown and harvested within one season. Many are perennials that take three or more years to develop a harvestable portion such as berries or roots. Some are trees that must be several years old before leaves or fruits can be harvested in quantity.

As of this date, the full seasonal cycle has not been completed and the hardiness of all the species has not been confirmed. Certain plants are marginally hardy, such as *Vitex negundo* v. *heterophylla* (potentially a 20-foot small tree or shrub), which dies back to the crown in winter yet grows taller and fuller each season. Whether or not the *Vitex* and the other marginally hardy species can yield a useful fraction under these conditions has yet to be determined.

A printout of the project database was evaluated by project consultant Jeffrey C. Yuen, who indicated which species (if grown, tested, processed and priced appropriately) would be readily accepted in preference to imported Chinese herbs by the market composed of herbal practitioners in the New York City area. This information was combined with available data on cultivation to categorize the plant species in the following way.

Evaluation Categories

- Group A: Preliminary indications for marketability are good; prospects for cultivation in the Northeast appear to be favorable.
- Group B: Preliminary indications for marketability are good; cultivation in Northeast appears to be redundant, undesirable, not likely due to climatic factors, or otherwise qualified.
- Group C: Preliminary indications for marketability are unfavorable OR plant is a secondary species; plant may have horticultural or other scientific value.

A summary of the categorization of all project material is presented as follows:

Evaluation Summary

	<u>Category A</u>	<u>Category B</u>	<u>Category C</u>	<u>Total</u>
Species in field 1996	64	6	50	120
Additional species with plants/seeds in inventory	32	31	113	176
<i>Total</i>	96	37	163	296

Each of the 296 species is listed separately in Exhibits A, B and C, which correspond to the evaluation categories. In addition to the species binomial, the information presented in Exhibits A, B and C includes the following:

Species Listings (see Exhibits A, B and C)

Chinese (Pinyin) remedy name

Common name

Herbal properties, including nature (cold/warm), treatment strategy and organ system affinities

Cross-reference to three texts (BG = Bensky & Gamble/HH = Hong-yen Hsu/

DA = Duke & Ayensu, see Exhibit E)

Family

Miscellaneous comments (related species, zone information, additional references, etc.)

Source(s) of seed or plants

Seed was collected from 48 of the species grown, as presented in Exhibit D.

V. OUTREACH

High Falls Gardens (HFG) announced the SARE grower grant through a press release to local newspapers in the three corners area (New York, Massachusetts and Connecticut), and also notified all seven chapters of NOFA and the Extension Services in Columbia and Greene counties.

Articles on the project were printed in the HFG Spring and Summer 1996 newsletters and mailed to all correspondents. The Winter 1997 issue of the newsletter (in preparation) will contain a summary of the results described herein and will also be mailed to all correspondents.

HFG has prepared a one-to-two-hour talk and slide presentation on the results which is available to grower groups upon invitation.

VI. DISCUSSION AND CONCLUSION

- *The materials received represent a significant resource for farmers in the Northeast.*

The plants grown in the field in the 1996 season represent approximately 40% of the total number of species received from Mr. Newman. Because of the volume received and because many were received late in the season, these shipments represent a significant potential yet to be discovered. The herbalists of High Falls Gardens are making an effort to document and preserve as many of the plants and seeds as possible.

- *To obtain appropriate plant materials is only the first step in a complex process.*

To develop these plants for the market for traditional Chinese-style herbal remedies will require several more steps, including the following:

- Identify which species is or are suitable for each given remedy.
 - Confirm that the medicinal value of the product is equivalent to that of the imported Chinese remedy.
 - Define the on-farm processing requirements (cutting, drying and in certain cases other techniques such as soaking or stir-frying) for each remedy.
 - Calculate the number of hours of labor required to grow, harvest and process each remedy.
 - Perform market surveys to determine how much of a premium will be paid for a native-grown, organic product.
 - Develop marketing channels, potentially including the formation of grower cooperatives that can offer a wide variety of herbs to an individual herbalist or small pharmacy.
- *Growers in the Northeast can contribute to and benefit from a more widespread effort to develop the market for these herbs.*

A new network is forming among people in North America involved in the cultivation of Chinese herbs. Mr. Newman has given the plants and seeds in his collection to five other herbalists throughout the U.S.: two in Oregon, two in Ohio, and one in North Carolina. The herbalists of HFG have established relationships with the herbalists in the Eastern U.S., and intend to contact the West Coast herbalists as well, for purposes of sharing information. Among this group there seems to be general agreement on several assumptions, including:

- Farm-based cultivation of herbs will help preserve existing stocks of native plants in the wild. (Many of the native medicinal species are now endangered, the most famous example being *Panax quinquefolius*, American ginseng.)
- Organic and/or wild-simulated methods of cultivation will ensure that the medicinal quality of the plants is equivalent, or even superior, to that of wild plants.
- Regions of North America that differ in soil and climate will eventually grow different herbs, albeit with considerable overlap. This would be similar to the distribution of traditional cultivation in China.
- Because the market for these herbs is in early stages of formation, free sharing of information rather than proprietary product development will more rapidly develop the market.

If, within the next few years, growers in the Northeast become more knowledgeable about these herbs and their uses in traditional Chinese medicine, and if a significant experimental resource base exists, they will be in a good position to take advantage of this developing market.

VII. RECOMMENDATIONS

By funding this Grower Grant, the Northeast Region SARE program has already made a significant contribution to the initial stages of development of a potential new source of income for farmers. Continued support is needed to develop a resource base for these new activities, with the following objectives:

- Continue to grow out, document and preserve seed stocks of Category A and C species.
- Test comparable A and C species to confirm which are the most appropriate for each remedy.
- Define and develop on-farm, value-added processing methods.
- Within the next three years, increase the number of sites in the Northeast where these plants are field-grown, observed and tested.
- Expand outreach education efforts to familiarize growers in the Northeast with the herbs, the emerging market, and issues which affect market development and the growers' fair share of market revenue.

EXHIBIT A

Abbreviations Used in Exhibits A-C

Organ System Affinities

ST = Stomach, SP = Spleen, GB = Gall Bladder, Lv = Liver, SI = Small Intestine, HT = Heart, LI = Large Intestine, Lu = Lungs, UB = Urinary Bladder, KI = Kidney, TH = Triple Heater, PC = Pericardium

Reference Texts (See Exhibit E)

BG/HH/DA notes the page number on which the plant species is mentioned in the three primary reference texts:

BG = Bensky & Gamble

HH = Hong-yen Hsu

DA = Duke & Ayensu

Miscellaneous Abbreviations

sl = slightly

subst = substitute remedy or analog plant

coll = collected

unsp = unspecified

BG = botanic garden

RN = Robert Newman

UCB = Univ. of Calif. at Berkeley Botanic Garden

Category A Plants: *Preliminary indications for marketability are good; prospects for cultivation in the Northeast appear to be favorable.*

Acanthopanax gracilistylus / Wu Jia Pi

ACANTHOPANAX ROOT BARK

Properties: Acrid, bitter/WARM/Dispels wind-dampness (KI/Lv) BG/HH/DA p. 161/317/115 *Family:*

Araliaceae *Comment:* Antirheumatic

Source(s): Oregon Exotics; RN China UCB

Agastache rugosa / Huo Xiang

MINT, KOREAN/PATCHOULI

Properties: Acrid/SL WARM/Transforms dampness (Lu/SP/ST) BG/HH/DA p. 213/396/367 *Family:*

Lamiaceae *Comment:* Z6-9 Bown p. 75

Source(s): Richters; RN UCB [GROWN '95-96, SEED, SLIDES]

Alisma plantago-aquatica v. *orientale* / Ze Xie

WATER PLANTAIN

Properties: Sweet, bland/COLD/Drains dampness (KI/UB) BG/HH/DA p. 145/272/59 *Family:* Alismaceae

Comment: Bown Z5-8

Source(s): RN UCB

- Anemarrhena asphodeloides* / Zhi Mu KNOW MOTHER
Properties: Bitter/COLD/Clears heat (Lu/ST/KI) BG/HH/DA p. 56/115/396 *Family:* Liliaceae *Comment:* Genus of a single species?
Source(s): RN Beijing; We-Du (Japan) [GROWN '95-96, SEED, SLIDES]
- Angelica acutiloba* / Dang Gui ANGELICA ROOT, JAPANESE
Properties: Sweet, pungent/WARM/Supplements & moves blood (HT/Lv/SP) BG/HH/DA p. 1540/74
Family: Umbelliferae
Source(s): RN Denver BG [GROWN '96, SLIDES]
- Angelica dahurica* / Bai Zhi ANGELICA ROOT
Properties: Pungent/WARM/Removes wind, dissolves surface (Lu/ST) BG/HH/DA p. 145/75 *Family:* Apiaceae
Source(s): RN UCB; RN German Plant Inst; RN Nanjing; RN Beijing [GROWN '96, SLIDES]
- Angelica pubescens* / Du Huo ANGELICA ROOT
Properties: Bitter, acid/WARM/Dispels wind-dampness (KI/UB) BG/HH/DA p. 155/58,321/76 *Family:* Apiaceae *Comment:* A. laxiflora/megaphylla, Aralia cordata
Source(s): Oregon Exotics; RN ex China; RN Quarry Hill/Sichuan [GROWN '96, SLIDES]
- Angelica sinensis* / Dang Gui ANGELICA ROOT, CHINESE
Properties: Sweet, acrid, bitter/WARM/Tonifies blood (HT/Lv/SP) BG/HH/DA p. 329/77 *Family:* [Apiaceae] *Comment:* A. polymorpha
Source(s): RN Beijing; Hollis/Henri Andre, France July '96
- Arctium lappa* / Niu Bang Zi BURDOCK SEEDS
Properties: Acrid, bitter/COLD/Releases exterior (Lu/ST) BG/HH/DA p. 41/66/145 *Family:* Asteraceae
Source(s): RN China
- Arisaema consanguineum* / Tian Nan Xing JACK-IN-THE PULPIT RHIZOME
Properties: Bitter, acrid, toxic/WARM/Transforms phlegm-cold (Lv/Lu/SP) BG/HH/DA p. 191/691/108
Family: Araceae *Comment:* Dried tuberous stem, several other species also used, antitumor.
Source(s): RN unsp
- Artemisia annua* / Qing Hao SWEET ANNIE/WORMWOOD
Properties: Bitter/COLD/Clears & relieves summerheat (KI/Lv/GB) BG/HH/DA p. 110/246/146 *Family:* [Asteraceae] *Comment:* A. apiacea
Source(s): JL Hudson; RN Guangxi; RN Beijing [GROWN '95-96]
- Artemisia apiacea* / Qing Hao SWEET WORMWOOD
Properties: Bitter/COLD/Relieves summerheat, cools blood (Lv/GB) BG/HH/DA p. 146/246/147 *Family:* Asteraceae *Comment:* A. annua/capillaris/scoparia also used
Source(s): RN UK originally Beijing; RN Beijing [GROWN '96, SLIDES]
- Artemisia argyi* / Ai Ye MUGWORT LEAF
Properties: Bitter, pungent/WARM/Controls bleeding (Lv/SP/KI) BG/HH/DA p. 259/493/147 *Family:* Asteraceae *Comment:* A. princeps, montana
Source(s): RN coll Japan [GROWN '96, SLIDES]

- Artemisia capillaris* / Yin Chen Hao CAPILLARIS
Properties: Bitter, acrid/COOL/Drains dampness (Lv/SP/GB/ST) BG/HH/DA p. 146/246/148 *Family:* Asteraceae *Comment:* *A. scoparia*
Source(s): RN unsp plt [GROWN '96, SEED]
- Asparagus cochinchinensis* / Tian Men Dong ASPARAGUS TUBER
Properties: Sweet, bitter/V COLD/Tonifies yin (KI/Lu) BG/HH/DA p. 359//397 *Family:* Liliaceae
Source(s): RN Japan BG
- Astragalus complanatus* / Sha Yuan Ji Li MILK VETCH SEED
Properties: Sweet/WARM/Tonifies yang (KI/Lv) BG/HH/DA p. 351/553/ *Family:* Leguminosae *Comment:*
Source(s): RN Beijing [GROWN '96, SEED, SLIDES]
- Astragalus membranaceus* / Huang Qi MILK VETCH ROOT
Properties: Sweet/SL WARM/Tonifies qi (Lu/SP) BG/HH/DA p. 318/521/317 *Family:* Leguminosae
Source(s): RN Guangxi; Elxr; Rchtrs; Sds of Chg; RN Beijing [GROWN '95-96, SEED, SLIDES]
- Astragalus mongholicus* / Huang Qi MILK VETCH ROOT
Properties: Sweet/SL WARM/Tonifies qi (Lu/SP) BG/HH/DA p. 318/521/ *Family:* Leguminosae
Source(s): RN Beijing; RN German Plant Institute [GROWN '96]
- Atractylodes lancea* / Cang Zhu ATR. RHIZOME, BLACK
Properties: Acrid, bitter, aromatic/WARM/Transforms dampness (SP/ST) BG/HH/DA p. 216/389/152
Family: Asteraceae *Comment:* *A. chinensis/japonica*
Source(s): RN unsp plt
- Atractylodes macrocephala* / Bai Zhu ATR. RHIZOME, WHITE
Properties: Bitter, sweet/WARM/Tonifies qi (SP/ST) BG/HH/DA p. 321/524/153 *Family:* Asteraceae
Comment: Z6-8 Bown p90 "cultivated on a large scale"
Source(s): RN Beijing; RN Japan [GROWN '96, SLIDES]
- Biota orientalis* / Ce Bo Ye (or) Bo Zi Ren BIOTA TOPS OR SEED
Properties: Bitter, astringent/COLD/Cools blood controls bldg (Lu/Lv/LI) BG/HH/DA p. /515,643/
Family: Cupressaceae *Comment:* Seed: Sweet, pungent/NEUT/Tranq HT calms spirit (HT/Lv/KI)
Source(s): RN Kunming BG; RN plt Lawyer Nursery
- Bupleurum chinense* / Chai Hu HARE'S EAR ROOT
Properties: Bitter, acrid/COOL/Releases exterior (GB/Lv/PC/TH) BG/HH/DA p. 49/68/79 *Family:* Apiaceae *Comment:* *B. scorzoneraefolium* "kindling of the barbarians".
Source(s): RN Beijing; RN Shanghai; Hollis/Richters '95/China Natl Tree Seed Corp
- Celosia argentea* / Qing Xiang Zi CELOSIA SEEDS
Properties: Bitter, mild/COLD/Drains fire (Lv) BG/HH/DA p. 63/133/64 *Family:* Amaranthaceae *Comment:*
Source(s): RN UCB/India [GROWN '96, SEED, SLIDES]
- Chrysanthemum indicum* / Ye Ju Hua CHRYSANTHEMUM, WILD
Properties: Bitter, acrid/SL COLD/Clears heat & relieves tox (Lu/Lv) BG/HH/DA p. 91/71/160 *Family:* Asteraceae *Comment:* *C. boreale/lavandulaefolium* HH gives as *C.i.v. procumbens*
Source(s): RN plt Hong Kong/UCB

- Chrysanthemum morifolium / Ju Hua** **CHRYSANTHEMUM**
Properties: Acrid, sweet, bitter/SL COLD, COOL/Releases ext (Lv/Lu) BG/HH/DA p. 44/70/160 *Family:* Asteraceae *Comment:* C. sinense, Dendranthema grandiflora, Tanacetum
Source(s): RN Guangxi; Well-Sweep [GROWN '95-96]
- Cimicifuga dahurica / Sheng Ma** **BLACK COHOSH RHIZOME**
Properties: Sweet, acrid/COOL/Releases exterior (LI/Lu/SP/ST) BG/HH/DA p. 50/73/ *Family:* Ranunculaceae *Comment:* C. foetida
Source(s): RN commercial source
- Cnidium monnieri / She Chuang Zi** **CNIDIUM SEEDS**
Properties: Acrid, bitter/WARM/External application (KI) BG/HH/DA p. 452/774/81 *Family:* Apiaceae
Source(s): RN Beijing; RN Japan [GROWN '96, SEED, SLIDES]
- Codonopsis pilosula / Dang Shen** **BONNET BELLFLOWER**
Properties: Sweet/NEUTRAL/Tonifies qi (Lu/SP) BG/HH/DA p. 317/526/228 *Family:* Campanulaceae
Comment: C. silvestris/modesta, Z5-9 Bown p109
Source(s): Richters; Elixir; RN mixed garden sources [GROWN '95-96, SLIDES]
- Coptis japonica / Huang Lian** **COPTIS RHIZOME**
Properties: Bitter/COLD/Dispels heat & dries dampness (HT/Lv/GB/ST/LI) BG/HH/DA p. 77/155/
Family: Ranunculaceae *Comment:* C. chinensis, teetoides
Source(s): RN unsp
- Cornus officinalis / Shan Zhu Yu** **CORNELIAN CHERRY**
Properties: Sour/SL WARM/Stabilizes & binds (KI/Lv) BG/HH/DA p. 375//264 *Family:* Cornaceae
Source(s): RN commercial source
- Crataegus pinnatifida / Shan Zha** **HAWTHORN FRUIT**
Properties: Sour, sweet/SL WARM/Relieves food stagnation (Lv/SP/ST) BG/HH/DA p. 223/727/542
Family: Rosaceae *Comment:* C. cuneata, Z4-7 Bown p113 "native to northern China"
Source(s): RN Beijing; RN Central Siberia BG Novosibirsk Russia
- Cyperus rotundus / Xiang Fu** **NUT GRASS/EARTH ALMOND**
Properties: Acrid, sl bitter, sl sweet/NEUTRAL/Regulates qi (Lv/TH) BG/HH/DA p. 236/415/280 *Family:* Cyperaceae *Comment:* Z3-10 Bown p115
Source(s): RN Guangxi; JL Hudson [GROWN '96, SLIDES]
- Dianthus chinensis / Qu Mai** **PINKS, CHINESE**
Properties: Bitter/COLD/Drains dampness (UB/HT/SI) BG/HH/DA p. 138/283/239 *Family:* Caryophyllaceae *Comment:* Z4-7 Bown p118
Source(s): JL Hudson; Seeds of Change; Elixir; RN commercial source [GROWN '95-96]
- Dianthus superbus / Qu Mai** **PINKS, FRINGED**
Properties: Bitter/COLD/Drains dampness (UB/HT/SI) BG/HH/DA p. 138/283/239 *Family:* Caryophyllaceae *Comment:* Close to D. chinensis
Source(s): RN commercial source; RN seed exchg; RN UCB China; RN UCB Japan [GROWN '96]

- Dioscorea opposita / Shan Yao** YAM ROOT, CHINESE
Properties: Sweet/NEUTRAL/Tonifies qi (KI/Lu/SP) BG/HH/DA p. 320/525/285 *Family:* Dioscoreaceae
Comment: Bown p119 "hardest of commercially cultivated yams, thrives in northern China"
Source(s): RN Beijing BG
- Dipsacus asper / Xu Duan** TEASEL ROOT, SZECHUAN
Properties: Bitter, acrid/SL WARM/Tonifies yang (KI/Lv) BG/HH/DA p. 349/562/286 *Family:* Dipsacaceae
Comment: Used for broken bones
Source(s): RN Asia & Quarry Hill
- Dolichos lablab / Bian Dou** HYACINTH BEAN
Properties: Sweet/NEUTRAL/Clears & relieves summerheat (SP/ST) BG/HH/DA p. 109/249/324 *Family:* Leguminosae
Source(s): RN commercial [SEED, SLIDES]
- Eclipta prostrata / Han Lian Cao** ECLIPTA
Properties: Sweet, sour/COOL/Tonifies yin (KI/Lv) BG/HH/DA p. 365/584/164 *Family:* Asteraceae
Source(s): RN China; RN Japan coll Takasaburo 1993 [GROWN '96, SEED, SLIDES]
- Eleutherococcus senticosus / Ci Wu Jia** GINSENG, SIBERIAN
BG/HH/DA p. X/119 *Family:* Araliaceae *Comment:* Acanthopanax senticosus, Z3-8 Bown p122
Source(s): Seed Guild RFE 9/95; RN
- Eupatorium fortunei / Pei Lan** EUPATORIUM
Properties: Pungent/NEUTRAL/Resolves dampness, removes summerheat (SP/ST) BG/HH/DA p. /391/166 *Family:* Asteraceae *Comment:* E. shimadai (Taiwan) for summer common cold
Source(s): RN plt
- Forsythia suspensa / Lian Qiao** FORSYTHIA
Properties: Bitter, sl acrid/COOL/Clears heat & relieves tox (HT/Lv/GB) BG/HH/DA p. 86/193/460
Family: Oleaceae *Comment:* Z6-8 Bown p129
Source(s): RN Beijing
- Fritillaria cirrhosa / Chuan Pei** FRITILLARY BULB
Properties: Bitter/COLD/Moistens dryness, resolves phlegm, cntrls cough (HT/Lu) BG/HH/DA p. 177/679/ *Family:* Liliaceae *Comment:* like F. thunbergii
Source(s): RN (3 sources)
- Fritillaria thunbergii / Zhe Bei Mu** FRITILLARY BULB
Properties: Bitter/COLD/Cools & transforms phlegm-heat (HT/Lu) BG/HH/DA p. 177/679/ *Family:* Liliaceae
Comment: F. verticillata
Source(s): RN China
- Gentiana dahurica / Qin Jiao** GENTIAN ROOT
Properties: Bitter, pungent/NEUTRAL/Removes wind-dampness (ST/Lv/GB) BG/HH/DA p. 156/334/
Family: Gentianaceae
Source(s): RN Chiltern

- Gentiana macrophylla* / Qin Jiao GENTIAN ROOT
Properties: Bitter, acrid/SL COLD/Dispels wind-dampness (GB/Lv/ST) BG/HH/DA p. 156/334/352
Family: Gentianaceae *Comment:* Z5-9 Bown p132
Source(s): RN Chiltern; RN garden origin
- Gentiana scabra* / Long Dan Cao GENTIAN ROOT, CHINESE
Properties: Bitter/COLD/Clears heat & dries dampness (GB/Lv/ST) BG/HH/DA p. 81/159/353 *Family:* Gentianaceae *Comment:* "dragon gallbladder herb". *G. triflora*/manshurica/regescens, Z5-9 Bown p133
Source(s): RN Alpains; RN mixture, coll & garden
- Glycyrrhiza glabra* / Gan Cao LICORICE ROOT
BG/HH/DA p. 323/532/ *Family:* Leguminosae *Comment:* Rhizomes 2+ yrs, Z7-9 Bown p135
Source(s): Well-Sweep; RN Flowery Branch; RN Richters [GROWN '94-96, SEED, SLIDES]
- Glycyrrhiza uralensis* / Gan Cao LICORICE, MANCHURIAN
Properties: Sweet/NEUTRAL (raw) WARM (dry-fried)/Tonifies yin (HT/Lu/SP/ST (all 12)) BG/HH/DA p. 323/532/327 *Family:* Leguminosae *Comment:* *G. glabra*/inflata/glandulifera/echinata, Bown p135 "Manchurian, Central Asia"
Source(s): Seed Guild Novosibirsk Oblast Russia; RN Richters; RN German Plant Institute; RN Flowery Branch; RN Beijing [GROWN '96, SEED, SLIDES]
- Houttuynia cordata* / Yu Xing Cao CHAMELEON PLANT
Properties: Acrid/COOL/Clears heat & relieves toxicity (LI/Lu) BG/HH/DA p. 93/200/588 *Family:* Saururaceae *Comment:* *Polypara cordata* Z6-10 Bown p139
Source(s): Well-Sweep; We-Du; RN plt [GROWN '95-96]
- Imperata cylindrica* / Bai Mao Gen WOOLLY GRASS RHIZOME
Properties: Sweet/COLD/Stops bleeding (Lu/ST/SI/UB) BG/HH/DA p. 264/505/492 *Family:* Poaceae
Comment: I.c. 'Red Baron'
Source(s): We-Du; RN coll Kagawa [GROWN '96]
- Inula japonica* / Xuan Fu Hua ELECAMPANE, JAPANESE
Properties: Bitter, acrid/SL WARM/Transforms phlegm-cold (Lv/Lu/ST/SP) BG/HH/DA p. 193/697/
Family: Asteraceae
Source(s): RN Beijing [GROWN '96, SEED]
- Isatis indigotica* / Ban Lan Gen (or) Da Qing Ye ISATIS ROOT or LEAF
Properties: Bitter/V COLD/Clears heat & relieves toxicity (HT/Lu/ST) BG/HH/DA p. 87/178/210 *Family:* Brassicaceae
Source(s): RN Beijing [GROWN '96]
- Kochia scoparia* / Di Fu Zi CYPRESS, SUMMER
Properties: Sweet, bitter/COLD/Drains dampness (UB) BG/HH/DA p. 139/290/251 *Family:* Chenopodiaceae *Comment:* *Bassia scoparia*
Source(s): RN China; RN German Plt Inst (Russia) [GROWN '96, SEED, SLIDES]
- Leonurus sibiricus* / Yi Mu Cao MOTHERWORT, CHINESE
Properties: Acrid, bitter/SL COLD/Invigorates blood (HT/Lv/UB) BG/HH/DA p. 273/462/ *Family:* Lamiaceae/Mints *Comment:* Z4-8 Bown p150 "biennial, pink to off-wht flwrs"
Source(s): Richters; Seeds of Change; RN Frank Porter [GROWN '95-96, SEED, SLIDES]

- Lepidium apetalum / Ting Li Zi** LEPIDIUM SEEDS
Properties: Acrid, bitter/COLD/Relieves coughing & wheezing (Lu/UB) BG/HH/DA p. 204/106/211
Family: Cruciferae *Comment:* L. virginicum, Descurainia sophia, Rorippa montana, Draba nemorosa
Source(s): RN Beijing [GROWN '96, SEED]
- Ligusticum jeholense / Gao Ben** LOVAGE ROOT
Properties: Acrid/WARM/Releases exterior (UB) BG/HH/DA p. 34/54/87 *Family:* Apiaceae *Comment:* L. sinense/tenuissimum
Source(s): RN Beijing [GROWN '96, SEED, SLIDES]
- Ligusticum wallichii / Chuan Xiong** LOVAGE ROOT, SZECHUAN
Properties: Acrid/WARM/Invigorates blood (Lv/GB/PC) BG/HH/DA p. 266/X/88 *Family:* Apiaceae
Source(s): Oregon Exotics; Hollis '96
- Lilium brownii / Bai He** LILY BULB
Properties: Sweet, sl bitter/SL COLD/Tonifies yin (HT/Lu) BG/HH/DA p. 363/590/401 *Family:* Liliaceae
Comment: L. pumilum/longiflorum/tenuifolium or other spp.
Source(s): Oregon Exotics; RN plt UCB [GROWN '96, SLIDES]
- Lycium barbarum / Gou Qi Zi** MATRIMONY VINE FRUITS
Properties: Sweet/NEUTRAL/Tonifies blood (Lv/Lu/KI) BG/HH/DA p. 333/544/ *Family:* Solanaceae
Comment: Z5-9 Bown p154
Source(s): RN China; Well-Sweep; Richters [GROWN '94-'96, SEED, SLIDES]
- Lycium chinense / Gou Qi Zi** MATRIMONY VINE FRUITS
Properties: Sweet/NEUTRAL/Tonifies blood (Lv/Lu/KI) BG/HH/DA p. 333/257/607 *Family:* Solanaceae
Comment: Root Bark/Di Gu Pi p 72 is COLD
Source(s): JL Hudson; RN UCB; RN coll Kagawa Japan [GROWN '95-96]
- Mentha haplocalyx / Bo He** MINT, FIELD
Properties: Acrid, aromatic/COOL/Releases the exterior (Lu/Lv) BG/HH/DA p. 40/79/ *Family:* Lamiaceae
Comment: M. piperita/arvensis, RN: M. dahurica also used (not avail in West)
Source(s): Well-Sweep [GROWN '94-96]
- Morus alba / Sang Ye** MULBERRY LEAF, WHITE
Properties: Sweet, bitter/COLD/Releases exterior (Lv/Lu) BG/HH/DA p. 43/80.../449 *Family:* Moraceae
Comment: Sang Chih/Twig, Sang Bai Pi/Root bark, Sang Shen/Fruit, Z4-9 Bown 161
Source(s): RN China
- Ophiopogon japonicus / Mai Men Dong** WHEAT, LUSH WINTER
Properties: Sweet, sl bitter/SL COLD/Tonifies yin (HT/Lu/ST) BG/HH/DA p. 360/593/402 *Family:* Liliaceae *Comment:* Z6-10 Bown 167
Source(s): We-Du; RN coll China [GROWN '95-96]
- Paeonia lactiflora / Bai Shao** PEONY ROOT, WHITE
Properties: Bitter, sour/COOL/Tonifies blood (Lv/SP) BG/HH/DA p. 331/474,546/533 *Family:* Ranunculaceae *Comment:* P. albiflora, P. veitchii/obovata also used, Z2-8 Bown 170
Source(s): RN wild collected reliable source; RN coll Russia; RN plt China; Galen Burrell wild seed coll Siberia; Galen Burrell Beijing BG [GROWN '94-96]

- Paeonia suffruticosa* / Mu Dan Pi PEONY ROOT BARK, TREE
Properties: Acrid, bitter/COOL/Cools blood (HT/Lv/KI) BG/HH/DA p. 70/144/534 *Family:* Ranunculaceae *Comment:* Z5-8 Bown 170. (P. ostii 'Phoenix White' T. Hong et F.X. Zhang)
Source(s): Cricket Hill; RN Beijing [GROWN '95-96, SEED]
- Paeonia veitchii* / Chuan Shao Yao PEONY ROOT, RED
Properties: Sour, bitter/SL COLD/Invigorates blood (Lv/SP) BG/HH/DA p. 277/474/ *Family:* Ranunculaceae *Comment:* Used as Chi Shao
Source(s): RN seed exchange; Galen Burrell; RN reliable garden src; Will McLewin [GROWN '96]
- Patrinia scabiosaefolia* / Bai Jiang Cao PATRINIA
Properties: Acrid, bitter/SL COLD/Clears heat & relieves tox. (LI/Lv/ST) BG/HH/DA p. 92/238/633
Family: Valerianaceae *Comment:* also *Thlaspi arvensis*, *Sonchus brachyotus*, *P. villosa*
Source(s): Stonecrop; We-Du; RN Japan & Quarry Hill [GROWN '95-96]
- Perilla frutescens* / Zi Su Ye SHISO LEAF or SEED
Properties: Acrid, aromatic/WARM/Releases exterior (Lu/SP) BG/HH/DA p. 30/59,721/378 *Family:* Lamiaceae *Comment:* Seed (Zi Su): Acrid/Warm/Rel Coughing & Wheezing (LI/Lu); Stems a traditional remedy for morning sickness
Source(s): Stonecrop P.f. var 'Crispa'; Companion Plants [GROWN '94-96, SEED, SLIDES]
- Phellodendron amurense* / Huang Bai CORK TREE BARK, AMUR
Properties: Bitter/COLD/Clears heat & dries dampness (KI/UB) BG/HH/DA p. 80/161/577 *Family:* Rutaceae *Comment:* "yellow fir" *P. chinense/wilsonii*; Z3-9 Bn; Z4 FF
Source(s): Forest Farm
- Pinellia ternata* / Ban Xia PINELLIA RHIZOME
Properties: Acrid, toxic/WARM/Transforms phelgm-cold (Lu/SP/ST) BG/HH/DA p. 190/697/112 *Family:* Araceae *Comment:* Z6-9 Bn 177
Source(s): We-Du; RN UCB plt [GROWN '96, SLIDES]
- Plantago major* / Che Qian Zi PLANTAIN SEED
Properties: Sweet/COLD/Regulates water metabolism (Lv/KI/SI/Lu) BG/HH/DA p. 1298/ *Family:* Plantaginaceae
Source(s): RN coll China; RN Nanjing [GROWN '96, SEED, SLIDES]
- Platycodon grandiflorum* / Jie Geng BALLOONFLOWER
Properties: Bitter, acrid/NEUTRAL/Transforms phlegm-cold (Lu) BG/HH/DA p. 196/699/229 *Family:* Campanulaceae *Comment:* *Campanula* gr., *C. glauca*, *P. glaucum* (Bellflower family), Z3-8 Bn 179
Source(s): Richters; Seeds of Change, JL Hudson [GROWN '94-96, SEED, SLIDES]
- Polygonatum odoratum* / Yu Zhu (Huang Jing?) SOLOMON'S SEAL RHIZOME
Properties: Sweet/SL COLD/Tonifies yin (Lu/ST) BG/HH/DA p. 362/535/404 *Family:* Liliaceae *Comment:* *P. sibiricum/multiflorum/falcatum* (Japan)/*odoratum* v. *pluriflorum* (Korea); Z3-9 Bn 181
Source(s): We-Du; RN commercial [GROWN '95-96]
- Polygonum multiflorum* / He Shou Wu FO-TI ROOT & STEM
Properties: Bitter, sweet, astringent/SL WARM/Tonifies blood (Lv/KI) BG/HH/DA p. 328/547,643/508
Family: Polygonaceae *Comment:* *Helxine multiflorum*
Source(s): Elixir [GROWN '94-96]

- Portulaca oleracea* / Ma Chi Xian PURSLANE
Properties: Sour/COLD/Clears heat & relieves toxicity (LI/Lv) BG/HH/DA p. 98/223/520 *Family:* Portulacaceae
Source(s): RN Nanjing China
- Prunella vulgaris* / Xia Ku Cao SELFHEAL
Properties: Bitter, acrid/COLD/Drains fire (GB/Lv) BG/HH/DA p. 59/126/379 *Family:* Lamiaceae
Comment: hypertension; Z4-9 Bn 183, creeper/groundcover
Source(s): Richters; RN Japan UCB [GROWN '95-96, SEED, SLIDES]
- Prunus armeniaca* v. *ansu* / Xing Ren APRICOT KERNEL
Properties: Bitter, sl toxic/SL WARM/Relieves coughing (Lu/LI) BG/HH/DA p. 198/705/549 *Family:* Rosaceae
Comment: Moist due to high oil content, Z5-9 Bn 184
Source(s): RN FW Schumacher Co.
- Prunus persica* / Tao Ren PEACH KERNEL
Properties: Bitter, bland/NEUTRAL/Disperses stagnant blood (HT/Lv/LI) BG/HH/DA p. 1476/551 *Family:* Rosaceae
Comment: P.p.v. *dauriana* Z5-9
Source(s): RN FW Schumacher Co.
- Psoralea corylifolia* / Bu Gu Zhi PSORALEN FRUIT
Properties: Acrid, bitter/V WARM/Tonifies yang (KI/SP) BG/HH/DA p. 344/572/338 *Family:* Leguminosae
Source(s): RN Beijing; RN Nanjing [GROWN '96, SEED, SLIDES]
- Rheum palmatum* / Da Huang RHUBARB, CHINESE
Properties: Bitter/COLD/Purgative (HT/LI/Lv/ST) BG/HH/DA p. 115/92/ *Family:* Polygonaceae
Comment: *R. tanguticum* (N. China)/*officinale* (S. China)/*undulatum*/coreanum; Z5-8 Bn 189
Source(s): RN Flowery Branch; Richters; RN Beijing [GROWN '95-96]
- Salvia miltiorrhiza* / Dan Shen SAGE ROOT, RED
Properties: Bitter/SL COLD/Invigorates blood (HT/PC/Lv) BG/HH/DA p. 267/480/381 *Family:* Lamiaceae
Comment: *S. bowleyana/przewalskii*
Source(s): RN China [GROWN '96, SLIDES]
- Sanguisorba officinalis* / Di Yu BURNET/BLOODWORT ROOT
Properties: Bitter, sour/SL COLD/Stops bleeding (Lv/LI/ST) BG/HH/DA p. 255/512/558 *Family:* Rosaceae
Comment: Z4-8 Bn 198 *Source(s):* RN garden origin
- Saposhnikovia divaricata* / Fang Feng SILER
BG/HH/DA p. 32/53/91 *Family:* Apiaceae
Comment: Same as *Ledebouriella divaricata*
Source(s): RN Beijing; Hollis/Richters [GROWN '96, SLIDES]
- Schisandra chinensis* / Wu Wei Zi MAGNOLIA FRUIT
Properties: Sour/WARM/Stabilizes & binds (HT/KI/Lu) BG/HH/DA p. 376/624/422 *Family:* Schisandraceae
Comment: Bei-wei-zi (*Maximowiczia sinensis*) Z5-8 Bn 200
Source(s): Richters; RN Hokkaido; RN Beijing
- Schizonepeta tenuifolia* / Jing Jie SCHIZONEPETA STEM/BUD
Properties: Acrid, aromatic/SL WARM/Releases exterior (Lu/Lv) BG/HH/DA p. 31/60/382 *Family:* Lamiaceae
Source(s): RN Japan BG; RN China 2nd gen [GROWN '96, SEED, SLIDES]

- Scrophularia ningpoensis* / Xuan Shen FIGWORT ROOT, NINGPO
Properties: Salty, sweet, bitter/COLD/Cools blood (KI/Lu/ST) BG/HH/DA p. 69/151/599 *Family:* Scrophulariaceae *Comment:* *S. buergeriana* Z6-8 Bn 201
Source(s): RN Guangxi BG [GROWN '96, SEED, SLIDES]
- Scutellaria baicalensis* / Huang Qin SKULLCAP ROOT, BAIKAL
Properties: Bitter/COLD/Cools blood (Lu/ST/LI/GB) BG/HH/DA p. 75/165/382 *Family:* Lamiaceae
Comment: *S. macrantha/amoena/viscidula*; Z4-8 Bn 201
Source(s): RN Beijing; RN UCB; Richters; RN German Plt Inst [GROWN '95-96, SEED, SLIDES]
- Scutellaria barbata* / Ban Zhi Lian SKULLCAP PLANT
Properties: Pungent/NEUTRAL/Cleanses heat, removes toxin () BG/HH/DA p. /230/383 *Family:* Lamiaceae *Source(s):* RN UCB China [GROWN '96, SEEDS, SLIDES]
- Siegesbeckia orientalis* / Xi Jian Cao ST PAULSWORT
Properties: Bitter/COLD/Dispels wind-dampness (KI/Lv) BG/HH/DA p. 163/355/180 *Family:* Asteraceae
Comment: *Anisomeles indica* or *A. ovata* are also used as the herb.
Source(s): RN Shanghai
- Sinapis alba* / Bai Jie Zi MUSTARD SEED
Properties: Pungent/WARM/Promotes chi, expels phlegm (Lu) BG/HH/DA p. /700/213 *Family:* Cruciferae *Comment:* *Brassica hirta/alba*; widely cultivated as a forage & green manure crop.
Source(s): RN USDA Turkey; RN USDA Soviet Union [GROWN '96, SEED, SLIDES]
- Sophora flavescens* / Ku Shen SOPHORA ROOT
Properties: Bitter/COLD/Clears heat & dries dampness (UB/HT/Lv/LI/SI) BG/HH/DA p. 82/167/341
Family: Leguminosae *Comment:* Herbaceous perennial (*S. japonica* is pagoda tree)
Source(s): RN UCB; RN Japan BG [GROWN '96]
- Tribulus terrestris* / Bai Ji Li TRIBULI FRUIT
Properties: Acrid, bitter/WARM/Ext wind & stops tremors (Lv/Lu) BG/HH/DA p. 425/669/658 *Family:* Zygophyllaceae *Comment:* Annual in disturbed areas, e.g. orchards
Source(s): RN coll Los Angeles; RN Beijing [GROWN '96]
- Tussilago farfara* / Kuan Dong Hua COLTSFOOT
Properties: Acrid/WARM/Relieves coughing & wheezing (Lu) BG/HH/DA p. 200/712/184 *Family:* Asteraceae *Comment:* Z3-7 Bn 216 "rhizomatous & invasive"
Source(s): RN unsp plt
- Vaccaria segetalis* / Wang Bu Liu Xing VACCARIA SEEDS
Properties: Bitter/NEUTRAL/Invigorates the blood (Lv/ST) BG/HH/DA p. 285/488/246 *Family:* Caryophyllaceae
Source(s): RN China [GROWN '96]
- Viola yedoensis* / Zi Hua Di Ding VIOLA
Properties: Acrid, bitter/COLD/Clears heat & relieves toxicity (HT/Lv) BG/HH/DA p. 90/242/ *Family:* Violaceae *Comment:* *V. japonica*, *Amblytropis multiflora*, *Corydalis bungeana*, *Gentiana loureirii*
Source(s): RN commercial source

Xanthium sibiricum / Cang Er Zi

COCKLEBUR FRUIT

Properties: Sweet, sl bitter, toxic/WARM/Dispels wind-dampness (Lu) BG/IIH/DA p. 162/730/186

Family: Asteraceae *Comment:* Used in Massa Fermentata

Source(s): RN Beijing [GROWN '96, SEED]

EXHIBIT B

Category B Plants: *Preliminary indications for marketability are good; cultivation in the Northeast appears to be redundant, undesirable, not likely due to climatic factors, or otherwise qualified. (Please refer to page 1 of Exhibit A for a list of abbreviations used.)*

Abrus cantoniensis / Ji Gu Cao

CHINESE PRAYER BEADS

Properties: Pungent/WARM/Removes stagnant blood, sets fracture (Lv) BG/HH/DA p. 1316/ Family:

Leguminosae *Comment:* Tropical? *Zone 6*

Source(s): RN Guangxi BG

Abutilon theophrasti / Dong Kui Zi

VELVETLEAF

Properties: Sweet/COLD/Drains dampness (UB/LI/SI) BG/HH/DA p. 142/152/423 *Family:* Malvaceae

Comment: subst Malva verticillata

Source(s): RN China [GROWN '96] *secondary importance*

Achyranthes bidentata / Niu Xi

ACHRYANTHES ROOT

Properties: Bitter, sour/NEUTRAL/Invigorates blood (Lv/KI) BG/HH/DA p. 284/433/61 *Family:*

Amaranthaceae *Comment:* Z8-9 Bown p. 72

Source(s): RN UCB; RN UCB; RN Beijing *Zone 6*

Akebia trifoliata / Mu Tong

AKEBIA, THREE-FINGER

Properties: Bitter/COOL/Drains dampness (UB/HT/SI) BG/HH/DA p. 135// *Family:* Lardizabalaceae

Comment: Clematis armandi/montana instead (chuan mu tong). Bown Z7-9 p78 climber. FF Z6.

Source(s): Forest Farm *warm climate*

Albizia julibrissin / He Huan Pi

MIMOSA TREE BARK

Properties: Sweet/NEUTRAL/Nourishes HT & calm spirit (HT/Lv) BG/HH/DA p. 406//443 *Family:*

Mimosaceae *Comment:* Mimosa julibrissin/M. speciosa, flwrs used also (He Huan Hua), Z6-10

Source(s): Forest Farm *Zone 6*

Andrographis paniculata / Chuan Xin Lian

ANDROGRAPHIS

Properties: Bitter/COLD/Clears heat & relieves toxicity (LI/Lu/SI/ST) BG/HH/DA p. 95/174/53 *Family:*

Acanthaceae

Source(s): RN Guangxi; RN Japan BG; RN Guangxi; RN Nanjing #793, Japan BG *Zone 6 or warmer*

Carthamus tinctorius / Hong Hua

SAFFLOWER

Properties: Acid/WARM/Invigorates blood (Ht/Lv) BG/HH/DA p. 279/442/158 *Family:* Asteraceae

Source(s): Richters; RN garden source [GROWN '95-96] *grows better in Midwest*

Cassia obtusifolia / Jue Ming Zi

CASSIA/SICKLEPOD SEEDS

Properties: Bitter, sweet/COOL/Drains fire (Lv/KI/LI) BG/HH/DA p. 62/132/ *Family:* Leguminosae

Comment: Senna obtusifolia

Source(s): Richters *weedy, secondary, unexciting*

Coix lachryma jobi / Yi Yi Ren

JOB'S TEARS SEEDS

Properties: Sweet, bland/SL COLD/Drains dampness (Sp/Lu/KI) BG/HH/DA p. 134/280/488 *Family:*

Gramineae *Comment:* Bown p110

Source(s): Stonecrop; JL Hudson; Hollis/Nippon Shinyaku Inst for Botanical Res [GROWN '96, SLIDES]

Zone 6

Cuscuta chinensis / Tu Si Zi

DODDER SEEDS

Properties: Acrid, sweet/NEUTRAL/Tonifies yang (KI/Lv) BG/HH/DA p. 350/560/259 Family: Convolvulaceae Comment: C. japonica, parasitic on Chrysanthemum and beans etc.

Source(s): RN Beijing

parasitic plant

Cyathula capitata / Chuan Niu Xi

CALVES KNEES, SICHUAN

BG/HH/DA p. 1433/65 Family: Amaranthaceae

Comment: like Achyranthes bidentata, Duke p. 65

Source(s): RN Shanghai; RN Beijing

need more info.

Ephedra sinica / Ma Huang

EPHEDRA

Properties: Acrid, sl bitter/WARM/Releases exterior (Lu/UB) BG/HH/DA p. 281/292 Family: Ephedraceae

Comment: "hemp yellow"

Source(s): RN coll Mongolia; RN plt Central Asia; RN plt UCB

desert plant

Eucommia ulmoides / Du Zhong

RUBBER TREE, HARDY

Properties: Sweet, sl acrid/WARM/Tonifies yang (KI/Lv) BG/HH/DA p. 347/565/299 Family: Eucommiaceae

Source(s): Forest Farm

Zone 6

Evodia rutaecarpa / Wu Zhu Yu

EVODIA FRUIT

Properties: Acrid, bitter, sl toxic/HOT/Warms int, expels cold (KI/Lv/SP/ST) BG/HH/DA p. 303/377/575 Family: Rutaceae

Source(s): RN Camellia Forest; RN Japan BG; RN Nanjing

Tropical

Ginkgo biloba / Bai Guo

MAIDENHAIR TREE LEAVES & FRUIT

Properties: Sweet, bitter, astringent, sl toxic/NEUTRAL/Stabilizes & binds (KI/Lu) BG/HH/DA p. 389/611/356 Family: Ginkgoaceae Comment: Z3-9 Bown p134; FF Z4; female trees bear fruit

Source(s): Forest Farm

common

Lindera strychnifolia / Wu Yao

LINDERA ROOT

Properties: Acrid/WARM/Regulates qi (UB/LI/Lu/SP) BG/HH/DA p. 238/420/390 Family: Lauraceae

Source(s): RN Japan; RN Japan

need more info.

Liquidambar taiwaniana / Luo Luo Tong

SWEETGUM FRUIT

Properties: Bitter/NEUTRAL/Invigorates blood (Lv/ST) BG/HH/DA p. 286/465/357 Family: Hamamelidaceae Comment: L. styraciflua (Hud 2/95); L. formosana FF Z7

Source(s): Forest Farm

Zone 7

Lithospermum erythrorhizon / Zi Cao

GROMWELL ROOT

Properties: Sweet/COLD/Cools blood (Ht/Lv) BG/HH/DA p. 71/143/205 Family: Boraginaceae

Comment: Z8-9 Bown p153

Source(s): RN European seed exchange

Zone 8

Lonicera japonica / Jin Yin Hua

HONEYSUCKLE, JAPANESE

Properties: Sweet/COLD/Clears heat & relieves toxicity (LI/Lu/ST) BG/HH/DA p. 85/209/235 Family: Caprifoliaceae Comment: "gold and silver flower" serious weed Z4-9 Bown p153

common

- Lophatherum gracile / Dan Zhu Ye** **LOPHATHERUM**
Properties: Sweet, bland/COLD/Drains fire (HT/SI/ST) BG/HH/DA p. 59/120/493 *Family:* Gramineae
Source(s): RN Japan and China sources *need more info.*
- Magnolia liliflora / Xin Yi Hua** **MAGNOLIA FLOWER**
Properties: Acrid/WARM/Releases exterior (Lu/ST) BG/HH/DA p. 39/56/421 *Family:* Magnoliaceae
Comment: M. biondii/sprengeri/denudata/fargesii/salicifolia/kobus, Z6-9 Bn p 155
Source(s): RN commercial *Zone 6*
- Magnolia officinalis / Hou Po** **MAGNOLIA BARK**
Properties: Bitter, acrid, aromatic/WARM/Transforms dampness (Lu/SP/ST/LI) BG/HH/DA p. 215/393/421 *Family:* Magnoliaceae *Comment:* 15-20 yr-old plants used; Z6-9 Bn p 155
Source(s): RN unsp *Zone 6 common*
- Melia toosendan / Chuan Lian Zi** **CHINABERRY FRUIT**
Properties: Bitter/COLD/Regulates chi (Lv/PC/SI/UB) BG/HH/DA p. 1423/433 *Family:* Meliaceae
Source(s): RN unsp *Zone 6*
- Panax ginseng / Ren Shen** **GINSENG, ASIAN**
Properties: Sweet, sl bitter/SL WARM/Tonifies qi (Lu/SP) BG/HH/DA p. 314/527/122 *Family:* Araliaceae
Comment: Z4-8 Bown 170 *I am not interested*
Source(s): RN Beijing
- Panax quinquefolius / Xi Yang Shen** **GINSENG, AMERICAN**
Properties: Sweet, sl bitter/COLD/Tonifies yin (HT/KI/Lu) BG/HH/DA p. 358// *Family:* Araliaceae
Comment: Z4-8 Bown 170 *I am not interested*
Source(s): Rick Cook, Michigan [GROWN '96]
- Phragmites communis / Lu Gen** **REED RHIZOME**
Properties: Sweet/COLD/Drains fire (Lu/ST) BG/HH/DA p. 61/123/495 *Family:* Gramineae
Comment: Z4-10 Bn 175; Hollis: 6' tall wild along East coast *aquatic*
Source(s): RN commercial; RN coll Japan
- Phytolacca americana / Shang Lu** **POKE ROOT**
Properties: Bitter, toxic/COLD/Expels water, disperses swelling (Lu/SP/KI/LI) BG/HH/DA p. 1108/
Family: Phytolaccaceae *Comment:* P. esculenta; Z3-9 Bn 176 *common not interested*
- Polygonum cuspidatum / Hu Chang** **KNOTWEED RHIZOME**
Properties: Sour, bitter, sl pungent/COLD/Clears heat BG/HH/DA p. 1147/507 *Family:* Polygonaceae
Comment: stalks/canes used *not interested*
Source(s): RN Kagawa Japan
- Pueraria lobata / Ge Gen** **KUDZU ROOT**
Properties: Sweet, acrid/COLD/Releases the exterior (SP/ST) BG/HH/DA p. 47/225/339 *Family:* Leguminosae *Comment:* Z7-10 *common*
- Rehmannia glutinosa / Sheng Di Huang (or) Shu Di Huang** **FOXGLOVE, CHINESE**
Properties: Sweet, bitter/COLD/Cools the blood (HT/KI/Lv) BG/HH/DA p. 68/148/597 *Family:* Scrophulariaceae *Comment:* R. chinese, Digitalis glutinosa Z8-10 Bn 189 "many variants available in China" *Source(s):* RN UCB plt *Zone 7*

- Rubia cordifolia / Qian Cao Gen MADDER ROOT
Properties: Bitter/COLD/Stops bleeding (HT/Lv) BG/HH/DA p. 257/510/568 *Family:* Rubiaceae
Comment: Tender, Bn 193
Source(s): Oregon Exotics *warm shade plant*
- Trichosanthes kirilowii / Gua Lou Ren CUCUMBER, CHINESE
Properties: Sweet/COLD/Cools & transforms phlegm-heat (LI/Lu/ST) BG/HH/DA p. 179/688/277 *Family:* Cucurbitaceae *Comment:* T. rosthornii, uniflora
Source(s): RN Beijing; RN Japan; RN Japanese BG [GROWN '96] *maybe*
- Vitex negundo v. heterophylla / Huang Jing Zi CHASTE TREE FRUIT
Properties: Pungent, bitter/WARM/Dispels wind, resolves phlegm BG/HH/DA p. 1820/642 *Family:* Verbenaceae *Comment:* Dried ripe fruit; Z6-10 Bn 221
Source(s): Well-Sweep; Richters; Comp Plts; RN Chiltern [GROWN '94-96, SLIDES] *Zone 6*
- Vitex rotundifolia / Man Jing Zi SEASHORE VITEX FRUIT
Properties: Bitter, acrid/COOL/Releases the exterior (UB/Lv/ST) BG/HH/DA p. 44/84/ *Family:* Verbenaceae *Comment:* V. trifolia; HH: ocular pain, headache, common cold
Source(s): RN Nanjing BG; RN Quarry Hill/coll Japan; RN Beijing *Zone 6*
- Zea Mays / Yu Mi Xu CORN SILK
Properties: Sweet/NEUTRAL/Drains dampness (Lv/UB/GB). BG/HH/DA p. 150/293,810/501 *Family:* Poaceae *Comment:* "jade rice whiskers"
Common
- Ziziphus jujuba / Da Zao DATE, CHINESE
Properties: Sweet/NEUTRAL/Tonifies qi (SP/ST) BG/HH/DA p. 322/538/539 *Family:* Rhamnaceae
Comment: Buckthorns, Z. jujuba v. inermis, Z. vulgaris v. inermis; Z6-10 *Zone 6*
Source(s): JL Hudson; RN Beijing
- Ziziphus spinosa / Suan Zeo Ren SOUR JUJUBE SEED
Properties: Sweet, sour/NEUTRAL/Nourishes HT & calms spirit (GB/HT/Lv/SP) BG/HH/DA p. 404/645/ *Family:* Rhamnaceae *Comment:* Z. jujuba v. spinosa
Source(s): RN unsp; RN Nanjing *Zone 6*

EXHIBIT C

Category C Plants: *Preliminary indications for marketability are unfavorable OR plant is a secondary species; plant may have horticultural or other scientific value.*
(Please refer to page 1 of Exhibit A for a list of abbreviations used.)

Acanthopanax senticosus / ACANTHOPANAX ROOT BARK
Family: Araliaceae
Source(s): RN Beijing

Acanthopanax sessiliflorus / Wu Jia Pi ACANTHOPANAX ROOT BARK
Properties: Pungent/WARM/Removes wind & dampness (Lv/KI) BG/HH/DA p. 161/317/116 Family:
Araliaceae Source(s): Seed Guild RFE; RN coll Siberica; RN Polish BG

Achillea wilsonii / Tu Yi Zhi Hao YARROW
Family: Asteraceae Comment: Duke other species p. 142
Source(s): RN UCB/China [GROWN '96, SEED, SLIDES]

Aconitum sp. / ACONITE ROOT
BG/HH/DA p. 297/369/526 Family: Ranunculaceae
Source(s): RN Japan BG; RN coll Asia; RN coll Siberia; RN commercial source

Acorus gramineus / Shi Chang Pu SWEET GRASS, CHINESE
BG/HH/DA p. 1/105 Family: Araceae
Source(s): RN plt UCB

Adenophora divaricata / ADENOPHORA ROOT
BG/HH/DA p. 1578 Family: Campanulaceae
Source(s): RN Japan

Adenophora sp. / Nan Sha Shen GLEHNIA ROOT
Properties: Sweet, sl bitter/COLD/Tonifies yin (Lu/ST (BG)) BG/HH/DA p. 358/578.../226 Family:
Campanulaceae
Source(s): RN Yunnan UCB; RN coll Japan; RN coll Asia; RN Yunnan UCB; RN Sichuan UCB;
RN Chiltern; RN Japan; RN commercial; RN seed exchange [GROWN '96, SEED, SLIDES]

Adenophora stricta / Nan Sha Shen ADENOPHORA ROOT
Properties: Sweet, bitter/COOL/Nourishes yin, expels phlegm, controls cough (Lu/Lv (HH)) BG/HH/DA
p. 1578/ Family: Campanulaceae Comment: A. tetraphylla/triphylla v. japonica Z3-8 Bown p74
Source(s): RN ex China

Agrimonia pilosa / Xian He Cao AGRIMONY
Properties: Bitter, acid/NEUTRAL/Stops bleeding (Lu/Lv/SP) BG/HH/DA p. 250/492,809/540 Family:
Rosaceae Source(s): RN Beijing; RN Quarry Hill/Sichuan; RN Nanjing; RN UCB; RN Nepal
[GROWN '96, SLIDES]

Allium chinense / Xie Bai CHIVES, CHINESE
Properties: Pungent, bitter/WARM/Dispels cold in chest (Lu/ST/LI) BG/HH/DA p. 1402/ Family:
Liliaceae Comment: A. bakeri, macrostemon
Source(s): RN commercial source

- Allium fistulosum* / Cong Bai (or) Cong Zi SPRING ONION BULB or SEED
Properties: Pungent/WARM/Promotes diaphoresis, tonifies yang (Lu/ST/LI) BG/HH/DA p. /44/393
Family: Liliaceae
Source(s): RN commercial source
- Allium ramosum* / ALLIUM
Family: Liliaceae
Comment: RN: cool but tonifies KI yang
Source(s): RN unsp [GROWN '96, SEED, SLIDES]
- Allium* sp. / ALLIUM
BG/HH/DA p. X//392 *Family:* Liliaceae
Source(s): RN German Plt Institute; RN Mongolia
- Anemone altaica* / Jiu Jie Chang Pu ANEMONE ROOT
BG/HH/DA p. /648/528 *Family:* Ranunculaceae
Comment: used like *Acorus gramineus*/Chang Pu?
Source(s): RN garden source
- Anemone tomentosa* / ANEMONE
BG/HH/DA p. /320,648/ *Family:* Ranunculaceae
Source(s): RN UCB China
- Angelica anomala* / Bai Zhi ANGELICA ROOT
Properties: Pungent/WARM/Removes wind, dissolves surface (Lu/ST) BG/HH/DA p. /45/75 *Family:* Apiaceae
Comment: used like *A. dahurica*, *formosana*
Source(s): RN Hungarian BG; RN Japan BG
- Angelica* sp. / ANGELICA ROOT
BG/HH/DA p. //74 *Family:* [Apiaceae]
Source(s): RN Japan BG; RN Tokyo BG
- Aralia californica* / ARALIA
Family: Araliaceae
Source(s): RN coll northern California
- Aralia cordata* / Du Huo ARALIA ROOT
Properties: Pungent, bitter/WARM/Removes wind-dampness (KI/UB) BG/HH/DA p. /58,321/117 *Family:* Araliaceae
Comment: used like *Angelica pubescens* & *Notopterygium incisum*
Source(s): Seed Guild RFE; RN commercial mixed; RN Japan UCB
- Aralia elata* / Chung Ken (or) Tsung Mu ARALIA BARK
Properties: Pungent/NEUTRAL/Supplements Qi, tranquilizes spirit BG/HH/DA p. /823/118 *Family:* Araliaceae
Comment: *A.e. subinermis*, a Japanese folk medicine
Source(s): Seed Guild RFE
- Arisaema* sp. / JACK-IN-THE PULPIT RHIZOME
BG/HH/DA p. 191/691/107-9 *Family:* Araceae
Source(s): RN Siberia; RN coll Asia; RN Japan

- Artemisia princeps / Ai Ye** **MUGWORT LEAF**
Properties: Bitter, pungent/WARM/Controls bleeding (Lv/SP/KI) BG/HH/DA p. 259/493/ *Family:* Asteraceae *Comment:* used like A. argyi, montana
Source(s): RN Japan BG; RN plt Japan
- Artemisia sp. /** **ARTEMISIA**
Family: Asteraceae
Source(s): RN English collector/Beijing
- Artemisia vulgaris / Ai Ye** **MUGWORT**
Properties: Bitter, acrid/WARM/Stops bleeding (SP/Lv/SI) BG/HH/DA p. 259/X/150 *Family:* Asteraceae
Comment: A. argyi, A. lavandulaefolia
Source(s): Elixir; Richters; Seeds of Change; RN UCB [GROWN '96, SLIDES]
- Aster tataricus / Zi Wan** **ASTER ROOT**
Properties: Bitter/SL WARM/Relieves coughing & wheezing (Lu) BG/HH/DA p. 199/707/151 *Family:*
Source(s): RN UCB [GROWN '95-96, SEED]
- Astragalus adsurgens / Huang Qi** **MILK VETCH ROOT**
Properties: Sweet, mild/WARM/Supplements Qi, Tonifies Yang (SP/Lu) BG/HH/DA p. /521/ *Family:* Leguminosae *Comment:* A. membranaceus, mongholicus
Source(s): RN China; RN seed exchange [GROWN '96, SLIDES]
- Astragalus chinensis /** **ASTRAGALUS**
Family: Leguminosae
Source(s): Porter/Riverview plt
- Astragalus sinicus / Hong Hua Cai** **ASTRAGALUS**
BG/HH/DA p. X//318 *Family:* Leguminosae
Source(s): RN mixed sources; RN Beijing [GROWN '96, SLIDES]
- Belamcanda chinensis / She Gan** **BLACKBERRY LILY**
Properties: Bitter/COLD/Clears heat & relieves toxicity (Lu) BG/HH/DA p. 104/179/363 *Family:* Iridaceae *Comment:* Ixia chinensis, B. punctata, Z5-10
Source(s): RN Nepal UCB; RN Beijing; RN Sichuan Quarry Hill [GROWN '94-96, SEED]
- Benincasa hispida / Dong Gua Ren** **WINTER MELON SEEDS**
Properties: Sweet/COLD/Drains dampness (Lu/ST/LI/SI) BG/HH/DA p. 135/277/269 *Family:* Curcubitaceae *Comment:* B. cerifera Bown p93
Source(s): RN Nichols [GROWN '96, SEED]
- Bletilla striata / Bai Ji** **BLETILLA**
Properties: Bitter, sweet/COOL/Stops bleeding (Lu/ST/Lv) BG/HH/DA p. 253/494/ *Family:*
Comment: Limodorum striatum, Epidendrum tuberosum, Z6-9 Bown p94
Source(s): RN unsp
- Bupleurum falcatum / Chai Hu** **BUP. ROOT, JAPANESE**
Properties: Bitter/COLD/Resolves surface, disperses heat (PC/Lv/TH/GB) BG/HH/DA p. 49/68/ *Family:* Apiaceae *Comment:* Z4-9 Bown p96
Source(s): RN English forms, mixed sources

- Bupleurum longiradiatum* / Chai Hu BUP. ROOT, KOREAN
BG/HH/DA p. 49/68/79 Family: Apiaceae
Source(s): RN Japan BG
- Cassia occidentalis* / Wan Jiang Nan Zi COFFEE SENNA SEEDS
Properties: Sweet, bitter/COLD/Cleanses lungs BG/HH/DA p. /196/222 Family: Leguminosae
Source(s): RN German Plt Institute [GROWN '96, SEED, SLIDES]
- Cassia tora* / Jue Ming Zi CASSIA/SICKLEPOD SEEDS
Properties: Bitter, sweet/COOL/Drains fire (Lv/KI/LI) BG/HH/DA p. 62/132/223 Family: Leguminosae
Source(s): RN China
- Catharanthus roseus* / Chang Chun Hua MADAGASCAR PERIWINKLE
Properties: Mild, bitter/COOL/Calms spirit BG/HH/DA p. /262/95 Family: Apocynaceae
Comment: anticancer, whole plt, Z10 Bown p102
Source(s): RN unsp [GROWN '96]
- Celosia cristata* / Ji Guan Hua COCKSCOMB
Properties: Sweet/COOL/Cools blood, controls bleeding BG/HH/DA p. /602/65 Family: Amaranthaceae
Source(s): JL Hudson; RN unsp [GROWN '96, SEED, SLIDES]
- Chaenomeles speciosa* / Mu Gua QUINCE, JAPANESE
Properties: Sour/SL WARM/Dispels wind-dampness (Lv/SP) BG/HH/DA p. X//541 Family: Rosaceae
Comment: Z4-8 Bown p105
Source(s): RN Japan BG
- Chelidonium majus v. asiatica* / Hakkutusai CELANDINE
Properties: Pungent, bitter, mild/WARM/Controls pain, controls cough BG/HH/DA p. /826/472 Family: Papaveraceae
Comment: Z4-8 Bown "genus of a single species, naturalized in North America"
Source(s): RN Japan
- Chimonanthus praecox* / La Mei Hua CHIMONANTHUS FLOWER
Properties: Pungent, bitter/NEUTRAL/Cools blood BG/HH/DA p. /445/225 Family: Calycanthaceae
Comment: Meratia praecox
Source(s): RN seed exchange
- Chrysanthemum sp.* / CHRYSANTHEMUM FLOWER
BG/HH/DA p. //159 Family: Asteraceae
Source(s): RN plt China UCB
- Cimicifuga foetida/europaea* / Sheng Ma BLACK COHOSH RHIZOME
Properties: Sweet, acrid/COOL/Releases exterior (LI/Lu/SP/ST) BG/HH/DA p. 50/73/531 Family: Ranunculaceae
Comment: C. dahurica/heracleifolia/simplex, Z4-8 Bown p107
Source(s): RN unsp plt [GROWN '96]
- Cinnamomum camphora* / Zhang Mu CAMPHOR TREE
BG/HH/DA p. X//388 Family: Lauraceae
Comment: Bown p108
Source(s): RN India

- Cirsium japonicum* / Da Ji THISTLE ROOT, JAPANESE
Properties: Sweet/COOL/Stops bleeding (Lv/SP) BG/HH/DA p. 255/498,562/161 *Family:* Asteraceae
Comment: *C. albescens*
Source(s): RN Chiltern; RN unsp
- Clematis* sp. / CLEMATIS
Family: Ranunculaceae
Source(s): RN UCB; Seed Guild/Kunming Botanical Institute Yunnan; RN Yunnan BG; RN Poland source; RN French BG; RN coll Siberia; RN coll Asia; RN Korea; RN China UCB
- Clerodendron trichotomum* / Chou Wu Tong GLORYBOWER LEAF
Properties: Acrid, bitter, sweet/COOL/Dispels wind-dampness (Lv) BG/HH/DA p. 164//638 *Family:* Verbenaceae *Source(s):* RN Poland BG
- Cocculus trilobus* / Fang Ji COCCULUS ROOT
Properties: Bitter, pungent/COLD/Promotes diuresis, disperses swelling (UB/Lu) BG/HH/DA p. 1273/435
Family: Menispermaceae *Comment:* subst for *Aristolochia fangchi/heterophylla*, *Sinomenium acutum*, *Stephania tetrandra* *Source(s):* RN Nanjing
- Codonopsis clematidea* / Dang Shen BONNET BELLFLOWER
BG/HH/DA p. 317/526/ *Family:* Campanulaceae *Comment:* same as *C. pilosula* (RN)
Source(s): Stonecrop; RN coll Taiwan; RN commercial sources
- Codonopsis* sp. / CODONOPSIS
BG/HH/DA p. X//227 *Family:* Campanulaceae
Source(s): RN seed exchange; RN mixed garden sources
- Crataegus cuneata* / Shan Zha HAWTHORN FRUIT
Properties: Sour, sweet/SL WARM/Relieves food stagnation (Lv/SP/ST) BG/HH/DA p. 223/727/ *Family:* Rosaceae *Source(s):* RN unsp
- Crataegus maximowiczii* / HAWTHORN FRUIT
Family: Rosaceae
Source(s): RN unsp; Seed Guild RFE; RN Central Siberia BG Novosibirsk Russia
- Crataegus sanguinea* / HAWTHORN FRUIT
Family: Rosaceae
Source(s): Seed Guild Novosibirsk Oblast Russia; RN Krasnoosyorsk mixed forest Novosib. Oblast
- Davallia mariesii* / Gu Sui Bu DAVALLIA
Comment: *Drynaria* subst, not hardy
Source(s): RN plt unsp
- Descurainia sophia* / Ting Li Zi WOODS WHITLOW-GRASS SEED
Properties: Pungent, bitter/COLD/Purges lungs, promotes water metabolism (Lu/UB) BG/HH/DA p. 1106/209 *Family:* Cruciferae *Comment:* *Lepidium virginicum/apetalum* & others
Source(s): RN Nanjing
- Dianthus amurensis* / PINKS
Family: Caryophyllaceae *Source(s):* RN commercial source [GROWN '96]

- Dictamnus sp. / DITTANY ROOT
Family: Rutaceae
Source(s): RN coll Siberia; RN coll Mongolia
- Dioscorea japonica / Shan Yao YAM RHIZOME
Properties: Sweet/WARM/Supplements SP/ST (HH) (SP/Lu) BG/HH/DA p. 1525/284 *Family:* Dioscoreaceae *Comment:* D. batatas, japonica, alata, doryophora also used
Source(s): RN Japan BG; RN plt Tokyo
- Dioscorea sp. / Shan Yao YAM RHIZOME
Properties: Sweet/WARM/Supplements SP/ST (HH) (SP/Lu) BG/HH/DA p. 320/525/282 *Family:* Dioscoreaceae *Source(s):* RN coll Japan; RN from SF Japantown; RN Japan BG
- Dipsacus japonicus / Xu Duan TEASEL ROOT, JAPANESE
Properties: Bitter, acid/SL WARM/Tonifies yang (KI/Lv) BG/HH/DA p. 349/562/287 *Family:* Dipsacaceae *Source(s):* Oregon Exotics; RN Japan BG
- Dipsacus sp. / TEASEL
BG/HH/DA p. X/286 *Family:* Dipsacaceae
Source(s): RN coll China [GROWN '96]
- Eclipta alba / ECLIPTA
Family: Asteraceae
Source(s): RN India/Richters [GROWN '96]
- Ephedra equisetina / Mu Tsei Ma Huang EPHEDRA
Properties: Acrid, sl bitter/WARM/Releases exterior (Lu/UB) BG/HH/DA p. 152,606/ *Family:* Ephedraceae *Comment:* E. sinica/distachya/intermedia, etc.; root also used
Source(s): RN Denver BG; RN Mongolia ? [GROWN '96]
- Ephedra sp. / EPHEDRA
Family: Ephedraceae
Source(s): Richters; RN Denver BG; RN plt Central Asia [GROWN '96]
- Eupatorium sp. / EUPATORIUM
BG/HH/DA p. 1391/166 *Family:* Asteraceae
Source(s): RN UCB/Sichuan; RN Japan; RN Tokyo BG
- Euphorbia pekinensis / EUPHORBIA
BG/HH/DA p. X/307 *Family:* Euphorbiaceae
Source(s): RN unsp [GROWN '96, SEED, SLIDES]
- Ferula asafoetida / A Wei ASAFOETIDA
Properties: Pungent, putrid/WARM/Disperses abdominal swelling BG/HH/DA p. 1725/84 *Family:* Apiaceae *Comment:* Z7-9 Bown p127 "flowers & seeds in 5th year, then dies"
Source(s): RN European BG; RN Fragrant Path [GROWN '96]
- Fritillaria sp. / FRITILLARY BULB
BG/HH/DA p. X/399 *Family:* Liliaceae
Source(s): RN mixed garden sources; RN seed exchange

- Gentiana* sp. / GENTIAN ROOT
BG/HH/DA p. X//351-3 *Family*: Gentianaceae
Source(s): RN UCB/China; RN Richard Stockwell Rare Plants; RN coll Asia
- Gentiana tibetica* / Qin Jiao GENTIAN ROOT
Properties: Bitter, acrid/SL COLD/Dispels wind-dampness (GB/Lv/ST) *BG/HH/DA* p. 156// *Family*: Gentianaceae *Source(s)*: Richters; RN unsp [GROWN '95-96]
- Gleditsia sinensis* / Zao Jia GLEDITSIA FRUIT
Properties: Pungent, salty, sl toxic/WARM/Opens cavities, reslvs phlegm (Lu/SI) *BG/HH/DA* p. /694/224 *Family*: Leguminosae *Source(s)*: RN Beijing; RN China
- Glycyrrhiza* sp. / LICORICE ROOT
BG/HH/DA p. 323/532/ *Family*: Leguminosae
Source(s): RN Guangxi; RN Japan BG; RN from JL Hudson [GROWN '96]
- Gypsophila oldhamiana* / Yin Chai Hu BABY'S BREATH, MANCHURIAN
BG/HH/DA p. X//240 *Family*: Caryophyllaceae *Comment*: *G. paniculata*/others; RN: subst for *Stellaria dichotoma* v. *lanceolata*/Yin Chai Hu, root used
Source(s): RN UCB/Korea [GROWN '96, SLIDES]
- Heracleum hemsleyanum* / Du Huo HERACLEUM
Properties: Pungent, bitter/WARM/Removes wind-dampness (KI/UB) *BG/HH/DA* p. /321/ *Family*: Apiaceae *Comment*: subst for *Angelica pubescens* or *Aralia cordata*, root used
Source(s): RN coll San Francisco
- Hibiscus syriacus* / Mu Jin Hua ROSE-OF-SHARON FLOWER
Properties: Sweet, smooth, mild/COLD/Removes damp heat (Lu/SP) *BG/HH/DA* p. /503/426 *Family*: Malvaceae *Source(s)*: JL Hudson
- Hypericum* sp. / ST. JOHNSWORT
BG/HH/DA p. //361-2 *Family*: Hypericaceae
Source(s): RN plt unsp
- Ilex rotunda* / Jiu Bi Ying ILEX
BG/HH/DA p. //104 *Family*: Aquifoliaceae
Source(s): RN plt Kyushu
- Indigofera kirilowii* / NATURAL INDIGO
Family: Leguminosae *Comment*: *Indigofera tinctoria* subst for *Isatis tinctoria*, etc. (HH p. 203)
Source(s): RN unsp
- Inula brittanica* / Xuan Fu Hua ELECAMpane, CHINESE
BG/HH/DA p. X//172-3 *Family*: Asteraceae
Source(s): RN Polish BG; RN Japan [GROWN '96, SEED, SLIDES]
- Ipomoea nil* / Qian Niu Zi MORNING GLORY SEEDS
Properties: Bitter, toxic/COLD/Purges water (Lu/KI/LI) *BG/HH/DA* p. /107/ *Family*: Convolvulaceae
Comment: *I. hederacea*/purpurea, *Pharbitis nil*
Source(s): RN unsp [GROWN '96, SEED]

- Ipomoea purpurea* / Qian Niu Zi MORNING GLORY SEEDS
Properties: Bitter, toxic/COLD/Purges water (Lu/KI/LI) BG/HH/DA p. /107/ *Family:* Convolvulaceae
Comment: I. nil/hederacea, Pharbitis nil
Source(s): RN unsp
- Isatis praecox* / WOAD, IRISH
Family: Brassicaceae
Source(s): Stonecrop
- Leonurus heterophyllus* / Yi Mu Cao MOTHERWORT, CHINESE
Properties: Acrid, bitter/SL COLD/Invigorates blood (HT/Lv/UB) BG/HH/DA p. 273/462/371 *Family:* Lamiaceae/Mints *Comment:* Same as *L. artemisia*?
Source(s): RN ex China; RN Frank Porter [GROWN '96, SEED, SLIDES]
- Leonurus* sp. / MOTHERWORT
BG/HH/DA p. /461/371 *Family:* Lamiaceae
Source(s): JL Hudson [GROWN '95-96, SEED, SLIDES]
- Lepidium ruderae* / LEPIDIUM SEEDS
Family: Cruciferae *Comment:* Peppergrass
Source(s): RN Chiltern; RN commercial source [GROWN '96]
- Ligularia tussilagina* / Huo Xue Lian (or) Teng Wu COLTSFOOT PETIOLES
BG/HH/DA p. 200/184/ *Family:* Asteraceae *Comment:* Febrifuge
Source(s): RN Quarry Hill BG & Kyushu Japan
- Ligusticum* sp. / LOVAGE ROOT
BG/HH/DA p. //87 *Family:*
Source(s): RN plt Siberia
- Lilium pumilum* / Bai He LILY BULB, CORAL
BG/HH/DA p. 363// *Family:* Liliaceae
Source(s): RN commercial source; RN 3 diff srcs (1 collected); RN Fragrant Path
- Lilium* sp. / LILY BULB
BG/HH/DA p. //401 *Family:* Liliaceae *Comment:* RN: most used as yin tonifiers, maybe except *L. lancifolium* & *martagon* *Source(s):* RN coll Siberia; RN UCB/China; RN Japanese BG; RN seed exchg; RN coll Asia [GROWN '96]
- Liriope spicata* / LILY TURF
BG/HH/DA p. 360// *Family:*
Comment: subst for *Ophiopogon* *Source(s):* RN plt unsp
- Lobelia chinensis* / Ban Bian Lian LOBELIA, CHINESE
BG/HH/DA p. //229 *Family:* Campanulaceae
Source(s): RN plt unsp
- Luffa cylindrica* / Si Gua Luo VEGETABLE SPONGE
Properties: Sweet/NEUTRAL/Disperses phlegm, expels wind (Lu/ST/Lv) BG/HH/DA p. /466/274 *Family:* Curcubitaceae *Source(s):* RN Nara pref Jap/UCB; RN plt Sichuan [GROWN '96]

Lycium sp. / BG/HH/DA p. X//607 Family: Solanaceae Source(s): RN unsp	LYCIUM
Lycoris sp. / BG/HH/DA p. //67 Family: Amaryllidaceae Source(s): RN plt unsp	SPIDERLILY
Magnolia sp. / BG/HH/DA p. /56,393/420 Family: Magnoliaceae Source(s): RN unsp	MAGNOLIA
Malva chinensis / Family: Malvaceae Source(s): RN USDA [GROWN '96, SEED]	MALVA SEEDS
Malva verticillata / BG/HH/DA p. X//426 Family: Malvaceae Comment: RN: used as a harsh expellent for edema & excess dampness Source(s): RN German Plant Institute (Tibet); RN German Plt Inst (Russia) [GROWN '96, SLIDES]	MALVA SEEDS
Onosma paniculatum / BG/HH/DA p. X//205 Family: Boraginaceae Comment: RN: subst for Lithospermum/Zi Cao; hardiness? Source(s): RN Sichuan/Quarry Hill	
Paeonia anomala / Family: Ranunculaceae Source(s): Seed Guild Russia; RN seed exchange; RN Mongolia (may be misidentified); Galen Burrell; Will McLewin coll Russia 1995 [GROWN '96]	PEONY ROOT
Paeonia delavayi / Family: Ranunculaceae Source(s): RN seed exchange (may not be correct); RN from 2 BGs (prob more correct than seed exchg); Galen Burrell New Zealand seed [GROWN '96]	PEONY ROOT
Paeonia obovata / Tsao Shao Yao BG/HH/DA p. 277/474/ Family: Ranunculaceae Comment: used as Chi Shao (whole root) Source(s): Galen Burrell; RN seed exchange; RN wild source [GROWN '96]	PEONY ROOT
Paeonia sp. / Family: Ranunculaceae Source(s): RN plt unsp; Burrell wild seed coll Drôme, So France; Will McLewin coll Crimea 1995	PEONY ROOT
Patrinia sibirica / Family: Valerianaceae Source(s): RN coll Siberia	PATRINIA
Patrinia villosa / Bai Jiang Cao Properties: Acrid, bitter/SL COLD/Clears heat & relieves tox. (LI/Lv/ST) BG/HH/DA p. 92/238,506/ Family: Valerianaceae Comment: Root subst for Ixeris denticulata/laevigata or Mu Tou Hui (Taiwan) Source(s): RN Nara pref Jap/UCB; RN plt Sichuan [GROWN '96]	PATRINIA

- Persicaria sp. / PERSICARIA
Source(s): RN Kunming
- Phellodendron lavellei / PHELLODENDRON
Family: Rutaceae
Source(s): RN commercial
- Phytolacca acinosa / INDIAN POKEBERRY
BG/HH/DA p. X/477 Family: Phytolaccaceae *Comment:* Bown 176 (tender/no frost)
Source(s): RN commercial; RN German Plant Institute [GROWN '96, SEED, SLIDES]
- Picrasma quassioides / Ku Shu Pi PICRASMA BARK
Properties: Bitter/COLD/Cleanses heat, removes toxins *BG/HH/DA p. 1747/604 Family:* Simarubaceae
Comment: stem & root bark also used; for infections; anthelmintic
Source(s): RN Nanjing China
- Pinus massoniana / Song Jie PINE KNOTS/POLLEN/RESIN
Properties: Bitter/WARM/Dispels wind-dampness (Lv) *BG/HH/DA p. 170/341,783/481 Family:* Pinaceae
Comment: Resin is Sweet/WARM/Dries dampness (Lv/SP)
Source(s): RN China
- Pinus sp. / PINE TREE
BG/HH/DA p. X/480 Family: Pinaceae
Source(s): RN commercial; RN China
- Plantago asiatica / Che Qian Zi PLANTAIN SEED
BG/HH/DA p. 1/485 Family: Plantaginaceae *Comment:* Z3-9 Bn 178
Source(s): RN Beijing
- Plectranthus japonicus / Enmeiso (Jap.) PLECTRANTHUS/ISODON
BG/HH/DA p. 1830/ Family: Lamiaceae *Comment:* Isodon japonicus; strengthens stomach, antitumor, antibacterial *Source(s):* RN Japan BG
- Podophyllum hexandrum v. chinense / PODOPHYLLUM
Family: Berberidaceae
Source(s): RN unsp
- Polygala senega / SENEGA SNAKEROOT
Family: Polygalaceae
Source(s): RN Prairie Moon Nursery/Winona MN 55987
- Polygonatum humile / POLYGONATUM
Family: Liliaceae
Source(s): Seed Guild Novosibirsk Oblast Russia 9/95
- Polygonum orientale / Shui Hong Hua WATER PEPPER SEED & PLANT
Properties: Bitter, sweet, astringent/SL WARM/Tonifies blood (Lv/KI) *BG/HH/DA p. 328/124,346/508*
Family: Polygonaceae *Source(s):* JL Hudson

- Polygonum* sp. / POLYGONUM
BG/HH/DA p. //505 *Family*: Polygonaceae
Source(s): RN India [GROWN '96, SLIDES]
- Potentilla fragarioides* / Chin Tzu Yen POTENTILLA
BG/HH/DA p. /817/548 *Family*: Rosaceae *Comment*: also called Man Shan Hung, a folk medicine, no other information *Source(s)*: RN unsp
- Prunus japonica* / Yu Li Ren BUSH CHERRY PIT
Properties: Acrid, bitter, sweet/NEUTRAL/Moist laxatives (LI/SI/SP) *BG/HH/DA* p. 120/98/550 *Family*: Rosaceae *Comment*: *P. humilis*
Source(s): RN unsp
- Prunus mume* / Wu Mei PRUNE FLOWER & FRUIT
Properties: Sour/WARM/Stabilizes & binds (LI/Lv/Lu/SP) *BG/HH/DA* p. 378/424,615/550 *Family*: Rosaceae *Source(s)*: RN Nanjing China
- Prunus* sp. / PRUNUS
BG/HH/DA p. XI/549 *Family*: Rosaceae
Source(s): RN FW Schumacher Co.; RN coll Russia
- Pulsatilla* sp. / ANEMONE ROOT
Source(s): Seed Guild RFE 9/95; RN China; RN coll Siberia
- Pyrus ussuriensis* / PYRUS
Family: Rosaceae
Source(s): Seed Guild RFE 9/95
- Rhamnus dahurica* / RHAMNUS BARK
BG/HH/DA p. XI/538 *Family*: Rhamnaceae *Comment*: shrub, north temperate regions; RN: wind/damp Bi?; Duke: bark used
Source(s): Seed Guild Russia 9/95
- Rhamnus ussuriensis* / RHAMNUS BARK
Family: Rhamnaceae
Source(s): Seed Guild RFE 9/95
- Rheum* sp. / RHUBARB ROOT
BG/HH/DA p. XI/509 *Family*: Polygonaceae
Source(s): RN Siberia; RN coll Asia; RN coll China [GROWN '96, SLIDES]
- Rhododendron dauricum* / Man Shan Hong RHODODENDRON, DAURIAN
Properties: Bitter/COLD/Controls cough, removes phlegm (--) *BG/HH/DA* p. /817/296 *Family*: Ericaceae
Comment: "a folk medicine" also *R. mariesii*
Source(s): RN coll Asia
- Rhododendron* sp. / RHODODENDRON
BG/HH/DA p. //295 *Family*: Ericaceae
Source(s): RN unsp

- Rosa laevigata* / Jin Ying Zi ROSEHIP, CHEROKEE
Properties: Sour, astringent/NEUTRAL/Stabilizes & binds (UB/KI/LI) BG/HH/DA p. 387/622/554
Family: Rosaceae *Comment:* Z7-9 Bn 191
Source(s): Oregon Exotics; RN Shanghai wild-coll
- Rosa rugosa* / Mei Gui Hua ROSE FLOWER
Properties: Sweet, mild, bitter/WARM/Soothes Lv (Lv/SP) BG/HH/DA p. 1425/555 *Family:* Rosaceae
Comment: Z2-8 Bn p. 191.
Source(s): RN Central Siberia BG Novosibirsk Russia; RN Japan; RN Siberia plt
- Rosa* sp. / ROSE FLOWER/FRUIT
BG/HH/DA p. //553 *Family:* Rosaceae
Source(s): Seed Guild so. part of Krasnoyarsk Region Russia 9/95; RN plt Japan
- Rubus* sp. / Fu Pen Zi RASPBERRY FRUIT
Properties: Sweet, sour, mild/WARM/Supplements Lv & KI (Lv/KI) BG/HH/DA p. 1623/555 *Family:* Rosaceae
Source(s): Seed Guild forest/park area of Central Siberian BG 8/95; RN plt Nanjing
- Rumex japonicus* / Yang Ti DOCK ROOT
Properties: Bitter, sour/COLD/Clears heat (TH) BG/HH/DA p. 1511/ *Family:* Polygalaceae
Comment: R. nepalensis
Source(s): RN Japan BG [GROWN '96, SEED]
- Rumex* sp. / DOCK ROOT
BG/HH/DA p. X//510 *Family:* Polygalaceae
Source(s): RN Shanghai
- Salvia bulleyana* / Dan Shen SAGE ROOT, RED
Properties: Bitter/SL COLD/Invigorates blood (HT/PC/Lv) BG/HH/DA p. 267// *Family:* Lamiaceae
Comment: Hardiness?
Source(s): RN UCB/China
- Salvia przewalskii* / Dan Shen SAGE ROOT, RED
Properties: Bitter/SL COLD/Invigorates blood (HT/PC/Lv) BG/HH/DA p. 267// *Family:* Lamiaceae
Source(s): RN Yunnan UCB; RN UCB China
- Salvia* sp. / SAGE ROOT, RED
BG/HH/DA p. 1307/381 *Family:* Lamiaceae
Source(s): RN Sichuan; RN China UCB
- Sambucus chinensis* / Shuo Zhuo ELDER STEM & LEAVES
Properties: Sour/WARM/Dispels toxic cold & wind dampness BG/HH/DA p. 1352/ *Family:* Caprifoliaceae
Comment: S. formosana Taiwan, S. racemosa Japan (added to bathwater for neuralgia, lumbago, swellings, etc.
Source(s): RN coll Taiwan
- Sanguisorba tenuifolia* / BLOODWORT ROOT
Family: Rosaceae
Source(s): RN garden source

- Saxifraga stolonifera / Hu Er Cao SAXIFRAGE LEAVES
Properties: Mild, bitter, pungent/COLD/Removes heat, removes toxin BG/HH/DA p. /128/592 *Family:* Saxifragaceae *Comment:* "tiger ear leaf"
Source(s): RN plt unsp
- Schizonepeta sp. / SCHIZONEPETA STEM/BUD
BG/HH/DA p. /1382 *Family:* Lamiaceae
Source(s): RN Beijing
- Scrophularia nodosa / FIGWORT ROOT
Family: Scrophulariaceae *Comment:* Z6-8 Bn 201
Source(s): Richters [GROWN '95-96, SEED]
- Scutellaria lateriflora / SKULLCAP, MAD DOG
Family: Lamiaceae *Comment:* Z3-8 Bn 201
Source(s): Well-Sweep; RN plt unsp
- Semiaquilegia adoxoides / Tian Kui Zi SEMIQUILEGIA ROOT
Properties: Sweet/NEUTRAL/Promotes water metabolism, removes toxin BG/HH/DA p. /231/536
Family: Ranunculaceae
Source(s): RN Nanjing; RN commercial sources
- Senecio chrysanthemoides / Tu Tian Qi GROUNDSEL
Family: Asteraceae
Source(s): RN UCB Asia; RN commercial source; RN Berlin BG [GROWN '96, SEED, SLIDES]
- Senecio nemorensis / SENECIO
Family: Asteraceae
Source(s): Seed Guild, the Mountainous Altai Russia 9/95
- Siegesbeckia sp. / ST PAULSWORT
BG/HH/DA p. X//180 *Family:* Asteraceae
Source(s): RN Beijing; RN Japan BG; RN China [GROWN '96, SEED, SLIDES]
- Silene fortunei / Qu Mai SILENE
BG/HH/DA p. /284/243 *Family:* Caryophyllaceae *Comment:* Taiwanese subst for Dianthus
Source(s): RN China/UCB
- Solanum lyratum / Shu Yang Quan CLIMBING NIGHTSHADE
Properties: Sweet/COLD/Dispels heat, removes toxins BG/HH/DA p. /235/612 *Family:* Solanaceae
Comment: entire dried plt used, S. dulcamara
Source(s): RN Japan BG
- Talinum paniculatum / Tu Ren Shen TALINUM
BG/HH/DA p. X//
Source(s): RN Beijing
- Taraxacum sp. / DANDELION
BG/HH/DA p. X//184 *Family:* Asteraceae *Comment:* Z3-10
Source(s): Seeds of Change; RN unsp [GROWN '96]

- Thlaspi arvensis* / Bai Jiang Cao PENNYCRESS
Properties: Bitter, pungent, mild/COLD/Removes toxic heat (ST/LI/Lv) BG/HH/DA p. /238/214 *Family:* Cruciferae *Comment:* Sonchus brachyotus, Patrinia scabiosaefolia/villosa
Source(s): RN Flowery Branch; RN Nanjing; RN European BG
- Torreya grandis* / Fei Zi TORREYA NUT
Properties: Sweet, astringent/NEUTRAL/Kills intestinal parasites, etc. (ST/LI) BG/HH/DA p. /749/620
Family: Taxaceae *Comment:* Source: Camelia Forest in Carolinas
Source(s): RN Korea
- Trigonella foenum-graecum* / Hu Lu Ba FENUGREEK
Properties: Bitter/WARM/Tonifies yang (KI/Lv) BG/HH/DA p. 343/576/345 *Family:* Leguminosae
Comment: Bn 214 "a fodder crop"
Source(s): Richters; RN unsp
- Tripterygium* sp. / TRIPTERYGIUM
BG/HH/DA p. X//249 *Family:* Celastraceae
Source(s): RN unsp
- Veratrum nigrum* / Li Lu FALSE HELLEBORE ROOT
Properties: Bitter, pungent, toxic/COLD/Induces vomiting (Lv/Lu/ST) BG/HH/DA p. /766/409 *Family:* Liliaceae *Comment:* also V. schindlerii/grandiflorum/stamineum & Hemerocallis thunbergii
Source(s): RN coll Asia; RN commercial source; RN unsp
- Verbascum thapsus* / MULLEIN
Comment: Z5-9 Bn 218
Source(s): RN Nanjing China
- Veronicastrum* sp. / VERONICASTRUM
BG/HH/DA p. X//601 *Family:* Scrophulariaceae
Source(s): RN plt unsp
- Viola* sp. / VIOLA
BG/HH/DA p. /242/643 *Family:* Violaceae
Source(s): RN commercial
- Vitex* sp. / VITEX
BG/HH/DA p. //642 *Family:* Verbenaceae
Source(s): RN plt unsp
- Vitis quinquangularis* / Wu Jiao Ye Pu Tao GRAPE ROOT
BG/HH/DA p. X//649 *Family:* Vitaceae *Comment:* Duke: Tonic
Source(s): RN China
- Xanthium strumarium* / Cang Er Zi COCKLEBUR FRUIT
Properties: Sweet, bitter/WARM/Removes wind-dampness (Lu) BG/HH/DA p. /363/ *Family:* Asteraceae
Source(s): RN Guangxi; RN coll Japan; RN India [GROWN '96, SEED, SLIDES]

Zanthoxylum americanum /

PRICKLY ASH, NORTHERN

Family: Rutaceae *Comment:* used by Western herbalists, analog? Z4-8 Bn 222

Source(s): RN unsp

Zanthoxylum schinifolium / Chiao Mu

PRICKLY ASH SEED

Properties: Pungent, bitter, toxic/COLD/Promotes diuresis (SP/UB) BG/HH/DA p. /313/ *Family:*

Rubiaceae (?) *Comment:* *Z. bungeanum*; Z6

Source(s): RN Japan BG; RN Beijing

Exhibit D

SPECIES IN FIELD 1996 SEASON

NOTE: This list does not include species that were received too late in the summer to go into the field and are now indoors or in a winter nursery bed.

1 = Seed Collected

2 = Slides Taken

<u>Species Binomial</u>	<u>Remedy (Pinyin)</u>	<u>Grp.</u>	<u>Common Name</u>
Abutilon theophrasti	Dong Kui Zi	B	VELVETLEAF
1,2 Achillea wilsonii	Tu Yi Zhi Hao	C	YARROW
1,2 Adenophora sp.	Nan Sha Shen	C	GLEHNIA ROOT
1,2 Agastache rugosa	Huo Xiang	A	MINT, KOREAN/PATCHOULI
2 Agrimonia pilosa	Xian He Cao	C	AGRIMONY
1,2 Allium ramosum	N/A	C	ALLIUM
1,2 Anemarrhena asphodeloides	Zhi Mu	A	KNOW MOTHER
2 Angelica acutiloba	Dang Gui	A	ANGELICA ROOT, JAPANESE
2 Angelica dahurica	Bai Zhi	A	ANGELICA ROOT
2 Angelica pubescens	Du Huo	A	ANGELICA ROOT
Artemisia annua	Qing Hao	A	SWEET ANNIE/WORMWOOD
2 Artemisia apiacea	Qing Hao	A	SWEET WORMWOOD
2 Artemisia argyi	Ai Ye	A	MUGWORT LEAF
1 Artemisia capillaris	Yin Chen Hao	A	CAPILLARIS
Artemisia sp. (A. Gmelinii)	N/A	C	ARTEMISIA
2 Artemisia vulgaris	Ai Ye	C	MUGWORT
1 Aster tataricus	Zi Wan	C	ASTER ROOT
2 Astragalus adsurgens	Huang Qi	C	MILK VETCH ROOT
1,2 Astragalus complanatus	Sha Yuan Ji Li	A	MILK VETCH SEED
1,2 Astragalus membranaceus	Huang Qi	A	MILK VETCH ROOT
2 Astragalus mongholicus	Huang Qi	A	MILK VETCH ROOT
2 Astragalus sinicus	Hong Hua Cai	C	ASTRAGALUS
2 Atractylodes macrocephala	Bai Zhu	A	ATR. RHIZOME, WHITE
1 Belamcanda chinensis	She Gan	C	BLACKBERRY LILY
1 Benincasa hispida	Dong Gua Ren	C	WINTER MELON SEEDS
Carthamus tinctorius	Hong Hua	B	SAFFLOWER
1,2 Cassia occidentalis	Wan Jiang Nan Zi	C	COFFEE SENNA SEEDS
Catharanthus roseus	Chang Chun Hua	C	MADAGASCAR PERIWINKLE
1,2 Celosia argentea	Qing Xiang Zi	A	CELOSIA SEEDS
1,2 Celosia cristata	Ji Guan Hua	C	COCKSCOMB
Chrysanthemum morifolium	Ju Hua	A	CHRYSANTHEMUM FLOWER
Cimicifuga dahurica	Sheng Ma	A	BLACK COHOSH RHIZOME
Cimicifuga foetida/europaea	Sheng Ma	C	BLACK COHOSH RHIZOME
1,2 Cnidium monnieri	She Chuang Zi	A	CNIDIUM SEEDS
2 Codonopsis pilosula	Dang Shen	A	BONNET BELLFLOWER
1,2 Coix lachryma jobi	Yi Yi Ren	B	JOB'S TEARS SEEDS
2 Cyperus rotundus	Xiang Fu	A	NUTGRASS/EARTH ALMOND

<u>Species Binomial</u>	<u>Remedy (Pinyin)</u>	<u>Grp.</u>	<u>Common Name</u>
Dianthus amurensis	N/A	C	PINKS
Dianthus chinensis	Qu Mai	A	PINKS, CHINESE
Dianthus superbus	Qu Mai	A	PINKS, FRINGED
Dipsacus asper	Xu Duan	A	TEASEL ROOT, SZECHUAN
Dipsacus sp.	N/A	C	TEASEL ROOT
1 Dolichos lablab	Bian Dou	A	HYACINTH BEAN
Eclipta alba	N/A	C	ECLIPTA
1 Eclipta prostrata	Han Lian Cao	A	ECLIPTA
Ephedra equisetina	Mu Tsei Ma Huang	C	EPHEDRA
Ephedra sp.	N/A	C	EPHEDRA
1,2 Euphorbia pekinensis	N/A	C	EUPHORBIA
Ferula asafoetida	A Wei	C	ASAFOETIDA
Gentiana tibetica	Qin Jiao	C	GENTIAN ROOT
1,2 Glycyrrhiza glabra	Gan Cao	A	LICORICE ROOT
Glycyrrhiza sp. (G. inflata)	N/A	C	LICORICE ROOT
2 Glycyrrhiza pallidiflora	Nai Zhui	C	LICORICE ROOT
2 Glycyrrhiza uralensis	Gan Cao	A	LICORICE, MANCHURIAN
2 Gypsophila oldhamiana	Yin Chai Hu	C	BABY'S BREATH, MANCH.
Houttuynia cordata	Yu Xing Cao	A	CHAMELEON PLANT
Imperata cylindrica	Bai Mao Gen	A	WOOLLY GRASS RHIZOME
1 Inula britannica	Xuan Fu Hua	C	ELECAMPANE, CHINESE
1 Inula japonica	Xuan Fu Hua	A	ELECAMPANE, JAPANESE
1 Ipomoea nil	Qian Niu Zi	C	MORNING GLORY SEEDS
Isatis indigotica	Ban Lan Gen	A	ISATIS LEAF/ROOT
Isatis tinctoria	Ban Lan Gen	A	WOAD LEAF & ROOT
1,2 Kochia scoparia	Di Fu Zi	A	CYPRESS, SUMMER
1,2 Leonurus artemisia/sibericus	Yi Mu Cao	A	MOTHERWORT, CHINESE
1,2 Leonurus heterophyllus	Yi Mu Cao	C	MOTHERWORT, CHINESE
1,2 Leonurus sp. (L. cardiaca)	N/A	C	MOTHERWORT
1 Lepidium apetalum	Ting Li Zi	A	LEPIDIUM SEEDS
Lepidium ruderales	N/A	C	LEPIDIUM SEEDS
1,2 Ligusticum jeholense	Gao Ben	A	LOVAGE ROOT
2 Lilium sp. (L. davidii)	N/A	C	LILY BULB
Luffa cylindrica	Si Gua Luo	C	VEGETABLE SPONGE
1,2 Lycium barbarum	Gou Qi Zi	A	MATRIMONY VINE FRUITS
Lycium chinense	Gou Qi Zi	A	MATRIMONY VINE FRUITS
1 Malva chinensis	N/A	C	MALVA SEEDS
2 Malva verticillata	N/A	C	MALVA SEEDS
Mentha haplocalyx	Bo He	A	MINT, FIELD
Ophiopogon japonicus	Mai Men Dong	A	WHEAT, LUSH WINTER
Paeonia anomala	N/A	C	PEONY ROOT
Paeonia delavayi	N/A	C	PEONY ROOT
Paeonia lactiflora	Bai Shao	A	PEONY ROOT, WHITE
Paeonia obovata	Tsao Shao Yao	C	PEONY ROOT
1 Paeonia suffruticosa	Mu Dan Pi	A	PEONY ROOT BARK, TREE
Paeonia veitchii	Chuan Shao Yao	A	PEONY ROOT, RED
Panax quinquefolius	Xi Yang Shen	B	GINSENG, AMERICAN
Patrinia scabiosaefolia	Bai Jiang Cao	A	PATRINIA

<u>Species Binomial</u>	<u>Remedy (Pinyin)</u>	<u>Grp.</u>	<u>Common Name</u>
Patrinia villosa	Bai Jiang Cao	C	PATRINIA
1 Perilla frutescens	Zi Su Ye	A	SHISO LEAF/SEED
1,2 Phytolacca acinosa	N/A	C	INDIAN POKEBERRY
2 Pinellia ternata	Ban Xia	A	PINELLIA RHIZOME
1,2 Plantago major	Che Qian Zi	A	PLANTAIN SEED
1 Platycodon grandiflorum	Jie Geng	A	BALLOONFLOWER
Polygonatum odoratum	Yu Zhu/Huang Jing	A	SOLOMON'S SEAL RHIZOME
Polygonum multiflorum	He Shou Wu	A	FO-TI ROOT & STEM
2 Polygonum sp. (P. aviculare)	N/A	C	POLYGONUM
2 Prunella vulgaris	Xia Ku Cao	A	SELFHEAL
1,2 Psoralea corylifolia	Bu Gu Zhi	A	PSORALEN FRUIT
Rheum palmatum	Da Huang	A	RHUBARB, CHINESE
2 Rheum sp. (R. altaicum)	N/A	C	RHUBARB
1 Rumex japonicus	Yang Ti	C	DOCK ROOT
2 Salvia miltiorrhiza	Dan Shen	A	SAGE ROOT, RED
2 Salvia przewalskii	Dan Shen	C	SAGE ROOT, RED
Salvia sp.	N/A	C	SAGE ROOT, RED
Sanguisorba officinalis	Di Yu	A	BURNET/BLOODWORT ROOT
2 Saposhnikovia divaricata	Fang Feng	A	SILER
1,2 Schizonepeta tenuifolia	Jing Jie	A	SCHIZONEPETA STEM/BUD
1 Scrophularia ningpoensis	Xuan Shen	A	FIGWORT ROOT, NINGPO
1 Scrophularia nodosa	N/A	C	FIGWORT ROOT
1 Scutellaria baicalensis	Huang Qin	A	SKULLCAP ROOT, BAIKAL
1 Scutellaria barbata	Ban Zhi Lian	A	SKULLCAP PLANT
1,2 Senecio chrysanthemoides	Tu Tian Qi	C	GROUNDSEL
1,2 Siegesbeckia pubescens	Xi Jian Cao	C	ST PAULSWORT
1 Sinapis alba	Bai Jie Zi	A	MUSTARD SEED, WHITE
Sophora flavescens	Ku Shen	A	SOPHORA ROOT
Taraxacum sp.	N/A	C	DANDELION
Tribulus terrestris	Bai Ji Li	A	TRIBULI FRUIT
Trichosanthes kirilowii	Gua Lou Ren	B	CUCUMBER, CHINESE
Vaccaria segetalis	Wang Bu Liu Xing	A	VACCARIA SEEDS
2 Vitex negundo v. heterophylla	Huang Jing Zi	B	CHASTE TREE FRUIT
1 Xanthium sibiricum	Cang Er Zi	A	COCKLEBUR FRUIT
1,2 Xanthium strumarium	Cang Er Zi	C	COCKLEBUR FRUIT

Exhibit E

PRIMARY REFERENCE TEXTS

Bailey & Bailey, 1976. HORTUS THIRD (Cornell University/Macmillan Publishing Company, New York NY).

Bensky, Dan & Gamble, Andrew, 1993. CHINESE HERBAL MEDICINE MATERIA MEDICA, Revised Edition (Eastland Press, Inc., P.O. Box 12689, Seattle WA 98111).

Deno, Norman C., 1993. SEED GERMINATION THEORY & PRACTICE, Second Edition (Pennsylvania State University, 139 Lenor Drive, State College PA 16801).

Duke, James & Ayensu, Edward A., 1985. MEDICINAL PLANTS OF CHINA, Vols. I & II (Reference Publications, Inc., 218 St. Clair River Drive/Box 344, Algonac MI 48001).

Hsu, Hong-yen et al, 1986. ORIENTAL MATERIA MEDICA, A CONCISE GUIDE, (Oriental Healing Arts Institute/Keats Publishing, Inc., New Canaan CT).