

## Chinese Medicinal Herbs: Opportunities for Domestic Production\*

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During the past three decades, traditional Chinese medicine, based primarily on plant materials, has been adopted throughout the much of the Western world and become one of the fastest-growing healthcare choices in the United States (P. Darrin, pers. commun.). Evidence of growth in the practice of Chinese medicine is probably best illustrated by the increase in number of licensed Chinese medicine providers in the US, from 5,525 in 1992, to 14,228 today (B. Mitchell, pers. commun.). This increase in traditional Chinese medicine practitioners has increased the demand for medicinal plant material. Yet, practically all of the plant material (cultivated or wildcrafted) used in the practice of traditional Chinese medicine in the US is imported from China (P. Darrin, pers. commun.). Since many of the imported Chinese medicinal plant species are produced in environments similar to environments in the US, the possibility of domestic production of these plants for the US Chinese medicinal market exists. Domestic production of these botanicals would help insure the safety, freshness, and quality of the material.

Although the earliest practitioners of Chinese medicine in the US (many of whom were medical doctors) tended to use only acupuncture, Westerners have come to understand that dietary therapy, including the use of herbs and other botanicals, is central to traditional Chinese medicine. In addition, the practice of traditional Chinese medicine is based on a philosophy (holistic) quite different than the practice of “Western” medicine (Tierra 1998; Zhu 1998). Traditional Chinese medicine defines health as body integrity, adaptability, continuity, and balance with the doctor prescribing traditional plant, animal, and mineral remedies to sustain a self-regulatory status in the body (a balance of yin and yang). This contrasts with Western medicine in which health is defined as the absence of disease symptoms and the doctor diagnoses and prescribes clinically tested medicines to eradicate disease symptoms. Because the majority of plant materials used in Traditional Chinese medicine (amassed over 2000+ years through observations of patients by clinicians) have not been clinically evaluated in randomized, double-blind studies, Western medicine does not generally accept the efficacy or safety of the treatment.

The traditional paradigm of herbal usage in China incorporates three concepts that are relatively unfamiliar to Americans, but which can influence the way herbs are produced, marketed, and used in the US: (1) a nutritive approach in which foods are considered medicinal and some medicinal herbs are considered appropriate for everyday consumption, (2) an understanding that processing techniques used to prepare medicinal plant fractions for consumption affect the energetics, chemistry, and efficacy of the product, and (3) a reliance on traditional formulations to achieve the desired therapeutic result. For traditional Chinese medical practitioners, no firm distinction between food and medicine exists (Yang 1998; Zhu 1998). Indeed, some Chinese medicinal plants, such as those popularly recognized as adaptogens (*Astragalus membranaceus* root, *Lycium chinense* fruit, and *Schisandra chinensis* berries), are already in nutraceutical products in the US, including herbal teas, soft drinks, soups, and trail mixes.

Each of the many hundreds of medicinal plant fractions used in traditional Chinese medicine has an associated traditional processing procedure. According to the summary in Bensky and Gamble (1993), an English translation of the *Chinese Materia Medica* widely used in the US, processing has a specific medicinal purposes, to increase the potency, to minimize side effects, and/or to alter medicinal properties for a particular clinical use. Processing includes such activities as pulverization, slicing, bleaching, soaking, dry-frying, roasting, steaming, and sun-drying. Processed medicinal plants are subsequently sold directly to herbal dispensaries or practitioners that combine and administer herbs to patients or to manufacturers that combine the herbs into

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“patent remedies” and sell to practitioners.

Traditional practitioners in Chinese medicine are trained to give dietary advice, including recommendations of seasonal foods and foods with energetic properties to restore metabolic balance to the patient. Herbs are prescribed only in formulas that follow traditional practice, although these may be modified slightly to accommodate the individual needs of a patient. Formulas typically contain 8 to 15 different plant materials. Several American herbal product manufacturers, for example, Spring Wind, Nuherbs, and Golden Flower, supply the practitioner market with prepared traditional formulas made with imported herbs.

Given the many possibilities among the approximately 5000 plant species used in traditional Chinese medicine (Zhong Yao Da Ci Dian 1977), the task of selecting plants for production in the Western nations is substantial. Choices of plants should come from those with special appeal to practitioners (due to the frequency of use in traditional formulas) and from plants with appeal to a more general market (due to a perceived value as immune system stimulators, or adaptogens). For the traditional practitioner market, a systematic approach for choosing potential crops would include: plant material that is fresher or of higher quality than imported products (specifically aromatics and leaf crops), herbs that are expensive (due to over-harvesting or loss of habitat in China), and plant materials that are most often used in formulas. Plants with an appeal in the general market would include those that boost the immune system, contain antioxidants, and fight the aging process.

This report suggests eight Chinese medicinal plants that could be marketed in Western countries: *Anemarrhena asphodeloides*, *Mentha haplocalyx*, *Scutellaria baicalensis*, and *Trichosanthes kirilowii* for practitioners (Table 1) and *Astragalus membranaceus*, *Codonopsis pilosula*, *Lycium chinense*, and *Schisandra chinensis* for markets (Table 2).

**Table 1.** Chinese medicinal plants suggested for sale to practitioners. Information on plant cultivation is summarized from experimental trials at High Falls Gardens, supplemental information related to plant names, plant processing, and plant chemistry were verified using Foster and Chongxi (1992), Duke and Ayensu (1985a, b), and Zhu (1998).

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***Anemarrhena asphodeloides* Bunge, Liliaceae**

Common Chinese name	<i>Zhi mu</i> “Know mother”
Common English name	none
Annual/Perennial	Herbaceous perennial
Parts used	Sliced rhizome
Drug name	Rhizoma Anemarrhenae
Traditional uses in Chinese medicine	Classified as bitter and cold, <i>Anemarrhena</i> root is used to clear heat, promote production of fluids, and relieve dryness, and is recognized to have affinities with the lung, stomach and kidney channels.
Active constituents	Contains steroid saponins & norlignans
Propagation	Propagated by division or seed
Cultivation	The plant reaches harvest stage in three years and seems pest-free after six years of observation at High Falls Gardens.
Plant spacing	60 cm within rows
Harvest information	Rhizome/root harvested after 3 years & dried in sun
Processing	Rootlets are removed from the rhizomes and rhizomes are then dried in the sun.

***Mentha haplocalyx* Briq. / *M. arvensis* L., Lamiaceae**

Common Chinese name	<i>Bo he</i>
Common English name	Field mint
Annual/Perennial	Annual or perennial
Parts used	Aerial parts

Drug name	Herba Menthae
Traditional uses in Chinese medicine	Mints, whether in herbal formulas, drinks, soups, or other food items, functions to release to the exterior, that is, to direct the body energy upward and outward. <i>Bo he</i> is used to dispel wind-heat, clear the head and eyesight, treat headaches, pharyngolaryngitis, and measles.
Active constituents	Contains menthol & glucosides
Propagation	Propagated by cuttings
Cultivation	Similar to that of other mints, such as peppermint
Plant spacing	90–120 cm within rows
Harvest information	Aerial parts harvested multiple times per season
Processing	After harvest, the plant material is dried in the sun or shade.
Other comments	Has a sharper and more metholated flavor than culinary mint.

***Scutellaria baicalensis* Georgi, Lamiaceae**

Common Chinese name	<i>Huang qin</i>
Common English name	Baikal skullcap
Annual/Perennial	Perennial
Parts used	Rhizomes
Drug name	Radix Scutellariae
Traditional uses in Chinese medicine	<i>Huang qin</i> is one of the three “yellows,” the most important cooling herbs in the <i>Chinese Materia Medica</i> (the other two are <i>huang lian</i> , Chinese coptis root, <i>Coptis</i> spp., and <i>huang bai</i> , the inner bark of a tree, <i>Phellodendron amurense</i> ). Considered to cool the blood with affinities for the gall bladder, large intestine, lung, and stomach channels, <i>huang qin</i> is used to clear heat and dampness, treat fevers, stop bleeding, and prevent miscarriages.
Active constituents	Contains flavone derivatives
Propagation	Propagated by seed
Cultivation	This low-growing, sprawling plant seems to prefer a rock garden habitat with plenty of sun; tolerates poor, alkaline soil.
Plant spacing	90 cm within rows
Harvest information	Rhizomes harvested after 3 to 4 years
Processing	Rhizomes are stir-fried with or without alcohol until dark brown.

***Trichosanthes kirilowii* Max., Curcubitaceae**

Common Chinese name	<i>Gua lou zi</i>
Common English name	Chinese cucumber
Annual/Perennial	Herbaceous perennial
Parts used	Fruit pulp, fruit skins, seeds and root
Drug name	Fructus Trichosanthis, Radix Trichosanthis
Traditional uses in Chinese medicine	The root removes heat from the body, moistens dryness, and facilitates drainage of sores and abscesses. The fruit is used to remove heat, eliminate phlegm, alleviate chest pain, and treat constipation.
Active constituents	Fruit contains triterpene saponins, root contains the protein trichosanthin
Propagation	Propagated by seed or root division
Cultivation	A rich, well-drained, sandy-loam soil is preferred. Plants may be trained on a trellis once vines reach 3 feet in length.
Plant spacing	90 cm within rows
Harvest information	Fruit harvested in early autumn, roots harvested in late autumn
Processing	Roots are dried whole, fruit peel and seeds are dried separately.

**Table 2.** Chinese medicinal plants suggested for sale in American markets. Information on plant cultivation is summarized from experimental trials at High Falls Gardens, supplemental information related to plant names, plant processing, and plant chemistry were verified using Foster and Chongxi (1992), Duke and Ayensu (1985a, b), and Zhu (1998).

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***Astragalus membranaceus* (Fisch.) Bge. var. *mongholicus* (Bge.) Hsiao, Fabaceae**

Common Chinese name	<i>Huang qi</i>
Common English name	Astragalus or milk vetch
Annual/Perennial	Perennial
Parts used	Root (root of <i>A. membranaceus</i> and <i>A. membranaceus</i> var. <i>mongholicus</i> of are used, in other <i>Astragalus</i> spp. the seeds are used)
Drug name	Radix Astragali
Traditional uses in Chinese medicine	Both the root and seed are classified as sweet and warm. The root is considered to elevate the <i>Qi</i> and affects the lung and spleen channels, whereas the seed increases Yang and acts primarily on kidney and liver channels. <i>Huang qi</i> is present in a wide variety of formulas and is used in cooking to fortify soup stock.
Active constituents	Saponins, flavones, and polysaccharides
Propagation	Propagated by seed or cutting. Seeds must be scarified or soaked in water, germination may be challenging
Cultivation	<i>Astragalus</i> is adaptable to a variety of growing conditions, a sandy, well-drained soil is preferred.
Plant spacing	45–60 cm within rows
Harvest information	Roots harvested after 3 to 5 years
Processing	Dried roots are stir-fried with honey (1 part by weight to four parts root).
Other comments	Work is being done with other species of <i>Astragalus</i> that are used for their seed, such as <i>sha yuan ji li</i> , identified as <i>Astragalus complanatus</i> ( <i>A. sinicus</i> or <i>A. chinensis</i> ).

***Codonopsis pilosula* (Franch.) Nannf., Campanulaceae**

Common Chinese name	<i>Dang shen</i>
Common English name	Bellflower/poor man's ginseng
Annual/Perennial	Perennial
Parts used	Root
Drug name	Radix Codonopsis Pilosulae
Traditional uses in Chinese medicine	<i>Dang shen</i> is known as “poor man's ginseng” because medicinal properties of the plant resemble those of the Asian species, <i>Panax ginseng</i> ( <i>ren shen</i> ). Both <i>dang shen</i> and <i>ren shen</i> boost the Qi and have an affinity with the lung and spleen channels. American ginseng, <i>Panax quinquefolius</i> , is considered to have different properties: <i>xi yang shen</i> “western seas root,” nourishes the Yin and works through the heart, kidney and lung channels. This is a good example of traditional medicine making clear distinctions between two closely related species, but recognizes close similarities across genus and family lines.
Active constituents	Contains phytosterols & triterpenes
Propagation	Propagated by seed
Cultivation	<i>Codonopsis</i> is a climbing vine that grows well in part shade, plants must be provided with a trellis.
Plant spacing	30 cm within rows
Harvest information	Roots harvested after 3 years
Processing	Roots are roasted with millet (5:1, root:millet).

***Lycium chinense* Mill., Solanaceae**

Common Chinese name	<i>Go qi zi</i>
Common English name	Wolfberry or matrimony vine
Annual/Perennial	Perennial
Parts used	Fruits, root bark
Drug name	Fructus Lych, Cortex Lych Radicis
Traditional uses in Chinese medicine	<i>Lycium</i> yields two distinct medicinal portions. The fruits, <i>go qi zi</i> , are considered sweet and neutral and to nourish the blood. The root bark, <i>di gu pi</i> , “earth bone bark,” is sweet and cold and cools the blood. Both portions of the plant have affinity for the liver, lung, and kidney channels. The fruit, which are dried like raisins and sold in packages in Chinese supermarkets, have become part of trendy trail mixes in the US.
Active constituents	Contains betaine & sesquiterpenes
Propagation	Propagated by cutting or seed
Cultivation	The plant, which resembles raspberry bushes in form and behavior, yields fruit two to three years after planting. Yields are enhanced by rigorous pruning.
Plant spacing	90–120 cm within rows
Harvest information	Berries harvested several times per season, root bark may be harvested in late fall or early spring
Processing	Calyxes are removed from the fruit and fruit are dried; root bark is washed and then dried in the sun and cut into sections.

***Schisandra chinensis* (Turcz.) Baill., Magnoliaceae**

Common Chinese name	<i>Wu wei zi</i> /five flavor fruit
Common English name	none
Annual/Perennial	Perennial
Parts used	Berries
Drug name	Fructus Schisandrae
Traditional uses in Chinese medicine	The fruit, characterized as sour and warm with heart, kidney, and lung affinities, is used to stabilize and bind. <i>Schisandra</i> berries are used in a wide range of formulas, particularly for patients over 35, and are popular for commercial products in the US.
Active constituents	Fruit and seed contain lignans and essential oil
Propagation	Propagated by seed or cutting
Cultivation	<i>Schisandra</i> is a hardy, woody, dioecious vine. The fruit are borne on old wood in gradually increasing numbers of wild grape-sized clusters three years after planting. Cultivation requirements are similar to those of wine grapes.
Plant spacing	60 cm within rows
Harvest information	Berries are harvested multiple times per season
Processing	The berries are collected in autumn and dried in the sun; berries may also be steamed before being sun-dried.

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