



Wu Wei Zi

Schisandra

by **Anthony Harrison**

In the Chinese Herb Garden at the Bristol Botanic Garden we grow six Chinese Schisandra species. These are *S. chinensis*, *S. rubriflora*, *S. grandiflora*, *S. henryi* var *yunnanensis*, *S. aff. bicolor* and *S. aff. plena*. We are currently sourcing *S. sphenanthera*. The berries of Schisandra are the source of the herb Wu Wei Zi (five flavour seed). The main two sources are *S. chinensis* (bei/north Wu Wei Zi) and *S. sphenanthera* (nan/south Wu Wei Zi). Bensky lists 11 species as local source plants for Wu Wei Zi. Nineteen species in total are used in Chinese medicine. The distribution of Schisandra is divided between Asia and North America, which at one time were joined before the action of plate tectonics. There are 24 Asian species distributed from the Himalayas through China and Japan to Malaysia.

SCHISANDRA SCHISANDRACEAE IS a primitive genus that has often been classified under Magnoliaceae and Kadsura. It is still referred to as Kadsura vine. It differs from Kadsura simply in the fact that the fruits of Kadsura are held in a cluster rather than in a string as shown in the picture above.

Producing the fruits, which are needed for the herb, is not easy in the UK. The distribution for *S. chinensis* is in the far north of China, and its main centre for distribution is in Russia. It is full hardy, but the other species are from southern climates in the sub-tropical zone and often require greenhouse conditions. All of our species are being grown outside.

Another complication is the fact that the plant is dioecious. This means that the flowers of the male and female are on separate plants, and hence it cannot fertilise with any other plant unless it is of the opposite sex. Since they are virtually impossible to sex until they flower, it usually means that several plants need to be grown in the hope that you have male and female. For *S. chinensis* we have five plants. There is a good chance that we will produce fruit, but still all could be male or female plants and it will be some time before we can say for sure.

Clinical application

The overall category of use in Chinese medicine is as a tonic astringent to

“stabilise and bind”. The action is primarily on the Kidney/Liver and Heart organs and the taste is predominantly sour, although as its name suggests, it does have a background of the other four tastes.

It is an important herb in the materia medica as it belongs to a rare band of herbs that have adaptogenic action. *Ren Shen* (Ginseng Radix) is another, and is now both expensive and rare.

The modern pharmaceutical profession has only recently acknowledged an adaptogen title as distinct from a stimulant, but this has been known for hundreds of years in herbal medicine. A stimulant such as caffeine will release rapid energy to cope with stress, but at a price. This is followed by a sudden drop as it wears off. By contrast an adaptogen has a slow build-up action which sustains.

Adaptogens work through the stimulation of the cortisone hormone system from the cortex of the adrenal gland, which is designed to deal with long-term stress, unlike the more rapid adrenalin response arising from the action of the aldosterol hormone secretion from the inner medulla of the adrenal gland. Adaptogens reduce the negative effects from any stressful stimuli. This includes environmental and physical stress. It is also applicable to emotional stress which produces a similar stress response in the body.

Adaptogens have been extensively studied by Russian scientists and Schisandra was one of the herbs chosen for study along with *Eleutherococcus sp.* (Siberian ginseng) which is the source of the herb *Wu Jia Pi* (Acanthopanax Cortex).

Schisandra had long been used by the Nanai tribe who are listed (as Hezhe) as one of the 56 Chinese ethnic minorities. They have always had a strong influence from China and the Manchu race in particular. The Nanai tribes live around the Amur River, in Heilongjiang province, and their territory extended across the river into the Russian Far East region from whence they came. They were a shamanistic hunter-gathering culture who relied on salmon from the river and hunting in the winter in the forests.

Schisandra berries were used to enable them to follow sable deer for days without feeling exhausted. It was also said to give them better night vision to track their prey.

When Russian scientists tested this action they confirmed that an extract of Schisandra reduced the adverse effects of stress and increased tolerance to a wide range of stress stimuli such as heat and cold/ irradiation/ heavy metal toxicity, burns and physical exertion.

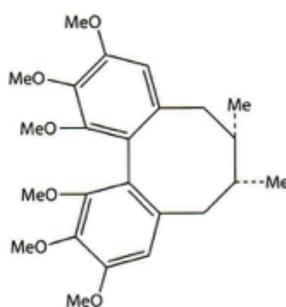
Historically in Chinese herbal medicine the focus for use has been for long-term chronic deficiencies resulting, for example, in chronic cough from Lung/Kidney deficiency. It is also indicated for use to treat insomnia and palpitations from Heart deficiency. Its binding astringency makes it a first choice for deficient sweating, either daytime sweating without exertion or night sweating. This stabilising binding function also prevents excessive loss of fluids from urine and bowel. Finally it is used to protect and regain Kidney essence deficiency following childbirth in women or excess sex in men.

Qualities of Wu Wei Zi

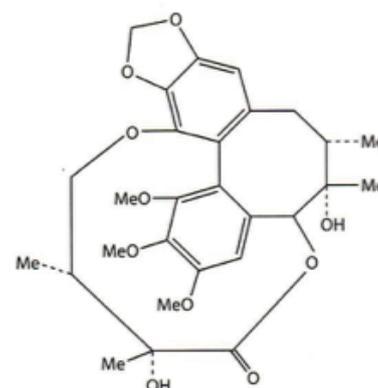
There is some confusion and debate regarding the quality of different forms of *Wu Wei Zi* from different source species, and one purpose of this article is to attempt to clarify the facts. The issue centres mainly on the relative use of *nan Wu Wei Zi* and *bei Wu Wei Zi*. Bensky *et al* follows the statement by Li Shi-Zhen that only *bei Wu Wei Zi* is capable of this deep tonic action for deficiency and



Climbing frames used for Schisandra species in the Bristol Botanic Garden.



Schisandrin



Gomisin D

Lignan phytoestrogens are the basis of the adaptogenic action.



Nanai (Hezhe) hunters discovered the strengthening power of Schisandra.

that *nan Wu Wei Zi* is suited only to treatment of Lung disorders where there is excess phlegm. The entry in the 1997 edition of the Chinese Pharmacopoeia lists both in the same entry, although modern editions separate them as two distinct herbs.

How can such closely related species give rise to two herbs with fundamentally different actions? Perhaps the chemistry of the fruit in each species is different. The main adaptogenic effect appears to be provided by the lignans, schisandrin and gomisin.

Modern research has shown that they have strong anti-oxidant actions that protect the Liver from a variety of toxins, as shown by a reduction in adverse Liver enzyme levels. But more than this, they target the RNA and

enzyme synthesis of cells to actually cause regeneration in Liver and Kidney cells. This is a quite remarkable correlation with the ancient Chinese use of the herb.

These chemicals are classed as phytoestrogens. It is an ideal herb in the treatment of menopause. There is considerable evidence that phytoestrogens protect the body from a diverse range of health disorders such as prostate/breast and bowel cancer as well as cardiovascular disease.

An extract of Schisandra appears to promote a cell mediated immune response through stimulation of macrophage activity. This could be a mechanism for the anti-inflammatory action often quoted.

There have been several comparative chemical studies of *nan* and *bei Wu Wei Zi*. There are subtle differences in the range of lignans in the schisandrin and gomisin families of chemicals, which can enable the two varieties to be differentiated using chemical analysis.

It is clear, however that both contain significant levels of the main active ingredient and that the fruit of *S. sphenanthera* (*nan Wu*

Wei Zi) must, by deduction, have some of the same tonic properties of *S. chinensis* (*bei Wu Wei Zi*).

This is also borne out when you taste the pulp of the fruit, which in both cases has the same unique sour and warming taste. By contrast, however, if you remove the pulp and eat the seed, you will find a very bitter herb that will have a different action. It is noticeable that *S. chinensis* has a lot more pulp on the fruit than *S. sphenanthera* and this I think is the key to understanding the different use of the herb varieties.

If the bitter seed acts to remove phlegm from the Lung, then this action will be much stronger in *nan Wu Wei Zi* as there is a much higher proportion of seed to pulp than the fleshy fruit of *bei Wu Wei Zi*.

The situation is analogous to the wild apricot *Prunus armeniaca*, which is also used in Chinese herbal medicine. The fruit pulp is sweet and tonic. The seed kernel is used as the herb *Xing Ren* to clear phlegm from the Lungs. The seed from northern China (*bei Xing Ren*) is very bitter and is also known as *ku Xing Ren*. The southern *Xing Ren* (*nan Xing Ren*) is comparatively sweet.

So, this is my conclusion to the ongoing debate on the use of these variations of *Wu Wei Zi*. *Bei Wu Wei Zi* is the strongest for tonification and while *nan Wu Wei Zi* does have a tonification action, it will be stronger for Lung phlegm. It should also be used at higher dose than the *bei* form when used as a tonic.

Tonification effects are also traditionally increased by lightly dry frying (*chao*) or honey processing (*mi zhi*). Further modification can be achieved by processing with wine (*jiu zhi*) to increase the effect on the Kidney or with vinegar (*cu zhi*) to enhance the astringency and restraining action.

The difference between *bei* and *nan Wu Wei Zi* is important especially as most of the *Wu Wei Zi* sold in the UK is that of *S. sphenanthera* (*nan*). So we now need to be able to tell them apart and ask our supplier to supply our preferred herb.

Pharmacognosy of *Wu Wei Zi*

Fortunately, it is not too hard to tell the difference between *nan* and *bei Wu Wei Zi* in the dried herb form. There are two main distinguishing features. The first I have



The fruit of *Schisandra chinensis* (*bei wu wei zi*) on the right compared with smaller *Schisandra sphenanthera* (*nan wu wei zi*).

already mentioned, which is the amount and quality of the pulp coating around the seed. The other feature is seen in the seed itself. You will need to soak the herb overnight to extract the seed from the pulp. You can try tasting the pulp from each but I could not tell them apart by taste alone. The differences are apparent in the picture (above).

S. chinensis (*bei Wu Wei Zi*): Thick oily wrinkled pulp which comes away easy from the seed after soaking. The seed is large and bi-lobed .

S. sphenanthera (*nan Wu Wei Zi*): Thin pulp that is much harder to get off the seed even after soaking. The resultant seed is small and single compared to *S. chinensis*.

Given the locations in which these plants grow, it is not surprising that the degree of pulp is a factor. *S. chinensis* grows in a very cold northern climate next to Siberia where the seasons are short. The seed needs more food reserves to cope with the stress. It is a closely evolved system and *Schisandra* is one of the most primitive of all flowering plants and has evolved the use of specific lignans which, by virtue of being phytoestrogens, also help to protect the human from stress.

In contrast *S. sphenanthera* grows in the much more forgiving southern land where the seasons are long and sun and nutrients high. It does not need to provide such

nutrition to the seed.

One interesting phenomenon I have observed while growing Chinese herbs is that the plants will do no more than is needed if there are enough resources. For example, if you want a strong single root of *Astragalus Radix* (*Huang Qi*), you must give it very poor dry soil in order for the deep taproot to develop in search of water. The *Huang Qi* grown in the rich soils of the garden has no thick taproot as the plant simply does not need it and can easily survive using fine adventitious roots.

This creates an interesting and rather unexpected challenge as we begin to move towards the creation of microclimates in the garden, as we need to be aware that stress plays an important role in the creation of medicinally active herbs. Many of the chemicals we use in herbal medicine are produced to counter stress in the plant either environmental or from being eaten by animals.

It may even come to pass that when we do get seed of *Schisandra chinensis*, then the fruit may have a poor quality as tonic as it simply does not need to provide the nutrient. It may adapt and realise that it is no longer growing in Siberia.

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