

MING MU FORMULA

MING MU DI HUANG WAN

ORIGINS: *Scrutiny of the Priceless Jade Case (Shen Shi Yao Han)* by Fu Ren-Yu, 1642.

Ming Mu Formula (*Ming Mu Di Huang Wan*) is a variation of **Rehmannia Six Formula** (*Liu Wei Di Huang Wan*) with modifications to direct its actions to nourish the eyes. This modification was first published in 1642 by Fu Ren-Yu, in his book *Scrutiny of the Priceless Jade Case (Shen Shi Yao Han)*.

GENERAL SIGNS/SYMPTOMS

Ming Mu Formula (*Ming Mu Di Huang Wan*) addresses chronic issues of the eyes and vision due to deficiency.

CLASSICAL ACTIONS

1. Nourishes kidney and liver yin, benefits the *jing*/essence
2. Nourishes liver blood and extinguishes liver wind
3. Improves vision and benefits the eyes
4. Improves vision and benefits the eyes

INGREDIENTS

PINYIN	LATIN	ENGLISH	PERCENT OF FORMULA
<i>Shu Di Huang</i> (chief)	<i>Rehmannia glutinosa</i>	Rehmannia (cured root tuber)	14.9%
<i>Chai Hu</i> (deputy)	<i>Bupleurum chinense</i>	Bupleurum Root	7.4%
<i>Dang Gui</i> (assistant)	<i>Angelica sinensis</i>	Dong Quai, Tang Kuei Root	7.4%
<i>Gou Qi Zi</i> (deputy)	<i>Lycium chinense</i>	Lycium Fruit, Chinese Wolfberry	7.4%
<i>Sheng Di Huang</i> (assistant)	<i>Rehmannia glutinosa</i>	Rehmannia (unprocessed root tuber)	7.4%
<i>Shan Yao</i> (deputy)	<i>Dioscorea oppositifolia</i>	Chinese Yam, Dioscorea Rhizome	7.4%
<i>Shan Zhu Yu</i> (deputy)	<i>Cornus officinalis</i>	Asiatic Dogwood, Cornus Fruit (w/o seed)	7.4%
<i>Ze Xie</i> (assistant)	<i>Alisma plantago-aquatica</i>	Asian Water Plantain Rhizome	7.4%
<i>Mu Dan Pi</i> (assistant)	<i>Paeonia suffruticosa</i>	Tree Peony Root Bark	7.4%
<i>Fu Ling</i> (assistant)	<i>Wolfiporia cocos</i>	Poria Sclerotium, Tuckahoe, Hoelen	7.4%
<i>Wu Wei Zi</i> (assistant)	<i>Schisandra chinensis</i>	Northern Schisandra Fruit	7.4%
<i>Bai Ji Li</i> (deputy)	<i>Tribulus terrestris</i>	Tribulus, Puncturevine Fruit	7.4%
<i>Ju Hua</i> (deputy)	<i>Dendranthema x grandiflorum/chrysanthemi</i>	Chrysanthemum Flower	3.7%

GENERAL INDICATIONS / MODERN APPLICATIONS

- Cataracts
- Eyes, excessive tearing
- Eyes, dry, red or itchy
- Eye strain
- Glaucoma
- Macular degeneration
- Nocturnal emissions
- Palms and soles, hot
- Photophobia
- Retinopathy
- Retinitis
- Spermatorrhea
- Tinnitus
- Vision, blurred
- Vision, gradual loss of
- Vision, weak
- Weakness of low back/hips/knees

FORMULA DISCUSSION

Ming Mu Formula (*Ming Mu Di Huang Wan*) is a variation of **Rehmannia Six Formula** (*Liu Wei Di Huang Wan*) modified to benefit the eyes and vision. **Rehmannia Six Formula** (*Liu Wei Di Huang Wan*) came into prominence as the paradigmatic formula for nourishing kidney yin during the Ming Dynasty (14th-17th Centuries). It was created by a Song Dynasty physician named Qian Yi in 1119 CE as a pediatric formula to help prenatal essence unfold into post-natal *jing*. It was used to address the “Five Slownesses” (*wu chi*) and “Five Limpnesses” (*wu ruan*). The Five Slownesses were slowness of the infant to learn to stand, start walking, prout hair, cut teeth, and a delay in beginning to speak.ⁱ The Five Limpnesses were softness of the head (failure of the fontanel to close) and all of the signs of what we today call hypotonia or “floppy infant syndrome.” All ten of these deficiencies reflect an insufficiency of the *jing*/essence to support proper growth and development.

Qian based his formula on Zhang Zhong-Jing’s *Shen Qi Wan* (Kidney Qi Pill) but completely transformed it from a geriatric qi and yang tonic into a pediatric *jing*/essence support. *Jing*/essence is a subcategory of kidney yin; it contains the blueprint for our growth. The *jing*/essence enters circulation via the *sanjiao* mechanism, which originates between

FORMULA ACTIONS

- Nourishes kidney and liver yin, benefits the *jing*/essence
- Nourishes liver blood and extinguishes liver wind
- Sedates fire
- Improves vision and benefits the eyes

TONGUE

Tongue will show signs of yin deficiency such as peeled coat, dry, dark red body, possibly with red spots.

PULSE

Thin, especially in the left *chi* position. May be rapid.

CONTRAINDICATIONS / NOTES

It is contraindicated to consume turnips while taking formulas that build yin and nourish blood, especially if the target for nourishment is in the upper body. This is because turnips are bitter, break up accumulations and direct them downward. Turnips are, therefore, more appropriate to facilitate the action of purging formulas or downward-draining formulas. They are especially effective to guide phlegm out of the body from the lungs or digestive tract.

Another general caution for yin/blood-nourishing formulas is to note their poor digestibility. Some patients, namely those with marked middle burner qi deficiency, may have difficulty breaking down such formulas, due to the cloying nature of these substances.

DOSAGE

Two tablets, three times per day.

the kidneys and travels up the spine to distribute the *jing*/essence into the organs via the back *shu* points.ⁱⁱ Each zang organ stores a portion of the *jing*/essence provided to it from the *sanjiao* mechanism and is able to transform it according to its own “essential” character. That is to say that the *jing*/essence stored in the liver will become liver essence; the *jing*/essence stored in the lungs will become lung essence, etc.ⁱⁱⁱ

The secondary way that the *jing*/essence is distributed is through the blood. Blood not only carries nourishment to the organs, it also receives (then distributes) contributions from the individual organs.^{iv} The blood is also the means by which prenatal qi and essence become postnatal qi. This happens primarily at St-30 (*Qi Chong*) and through the first trajectory of Chong Vessel. Qian understood appreciated the relationship between prenatal qi and postnatal qi. He understood that that the two mutually support one another and that the Five Limpnesses and the Five Slownesses in infants and children was an issue not of a deficiency of kidney yang, of which youth always possesses an abundance, but a matter of the yin-essence being unable to unfold normally; this perspective includes the idea that there is a dysregulated relationship between prenatal and postnatal qi. This is why he replaced the unprepared rehmannia (*sheng di huang*) with prepared rehmannia (*shu di huang*): because the prepared form is the strongest substance in the *materia medica* for generating essence and is at the same time a “superior herb for tonifying the blood.”^v It is also why he omitted the yang tonics from Zhang’s original.

So, Qian adapted a Han Dynasty yang tonic in order to treat children with an apparent *jing*/essence insufficiency during the Song Dynasty. Around 400 years later, Ming Dynasty physicians saw in Qian’s formula, an elegant way of nourishing the kidney and liver yin in the aging population. At the very end of the Ming Dynasty, Fu Ren-Yu published a further modification of *Liu Wei Di Huang Wan* (Rehmannia Six Formula) intended to “brighten the eyes” by nourishing the essence, the kidney and liver yin, and the liver blood, and by gently draining excess accumulated in the eyes.

In addition to the base formula of *Liu Wei Di Huang Wan*, Fu Ren-Yu added bupleurum (*chai hu*) to lift the formula upward and angelica root (*dang gui*) to nourish blood, and re-introduced the unprocessed form of rehmannia (*sheng di*) from Zhang’s original Han Dynasty formula to help clear heat and nourish yin. Finally, he added schisandra (*wu wei zi*), not only because it helps to astringe the essence and preserve qi, but because it also possessed the ability to “brighten the eyes.” The present formulation adds three additional ingredients to Fu’s formula to augment its ability to nourish and brighten the eyes.

SYNERGY OF INGREDIENTS

Ming Mu Formula (*Ming Mu Di Huang Wan*) consists of a base of **Rehmannia Six Formula** (*Liu Wei Di Huang Wan*) plus seven other ingredients. The proportions of each of the original six ingredients add up to just 51.9% of the version of **Ming Mu Formula** (*Ming Mu Di Huang Wan*) under present discussion, providing the formula with a solid base of addressing the underlying deficiencies of kidney and liver yin. The remaining ingredients steer the formula to the eyes for “brightening,” nourish blood, and clear minor obstructions to restore function.

The base formula of **Rehmannia Six Formula** (*Liu Wei Di Huang Wan*) consists of three tonic substances and three draining substances. The chief is prepared rehmannia (*shu di huang*), which nourishes yin, blood, and essence. Some herbalists think of prepared rehmannia as the yin complement to ginseng (*ren shen*). That is to say that prepared rehmannia is to the yin, blood, and essence, what ginseng is to the qi. It is the most important substance for nourishing the kidneys and liver, but it also enters the heart. Prepared rehmannia (*shu di huang*) augments the marrow and has a marked effect on improving vision. It enters the Chong and Ren channels and is therefore one of the most common substances in gynecological formulas.^{vi} The other two tonics from the base formula are cornus fruit (*shan zhu yu*) and Chinese yam/ dioscorea (*shan yao*). Both of these stabilize the essence and benefit the kidneys. Cornus (*shan zhu yu*) is often combined with prepared rehmannia (*shu di huang*) because together their ability to build essence is greater than either substance possesses on its own. Dioscorea (*shan yao*) builds essence through supporting the connection between postnatal qi and prenatal qi. It enters the lungs, spleen, and kidney to tonify qi and yin directly. It can also help restore the body's ability to supplement itself. Long-term use of dioscorea (*shan yao*) can eventually reverse qi and yin deficiency by a) supporting the three *zang* responsible for generating qi and yin, and b) regulating their relationship: it tonifies Earth (spleen), which supports Metal (lungs), which in turn supports Water (kidneys). In addition, dioscorea (*shan yao*) has a mild ability to astringe the essence.

Over the centuries, herbalists have come to see the three draining substances of **Rehmannia Six Formula** (*Liu Wei Di Huang Wan*) as compensating for specific tendencies in the tonics, especially their tendency to warm and to be sticky. It is important with sticky substances to keep the waterways open and regulated; and when heat is building up from tonics, it requires clearing or draining. Tree peony root bark/ moutan (*mu dan pi*) clears excess heat and ascending fire, cools the blood, and clears fire from deficiency. It also has an action to invigorate the blood. These actions are seen to compensate specifically for the warming effects that cornus (*shan zhu yu*) has on the liver, although it also clears deficiency heat from the kidneys. The Asian water plantain (*ze xie*) is seen to compensate for the warming action the chief ingredient has on the kidneys. It settles the ministerial fire, opens the kidney and bladder, and prevents warm accumulation in the lower burner as well as clearing deficiency heat. In terms of cooling and draining actions, it is perhaps the most common addition to formulas that tonify

the kidneys for this very reason. The sixth and final ingredient of the base formula is poria (*fu ling*). Poria (*fu ling*) is seen to compensate for the potentially stagnating properties of dioscorea (*shan yao*). Because even though dioscorea (*shan yao*) strengthens the spleen qi, it does not really improve its function to transport. The inclusion of poria (*fu ling*), therefore, completes the tonification of the spleen qi while also, along with Asian water plantain (*ze xie*) regulating the waterways.

To the base formula Fu Ren-Yu added bupleurum (*chai hu*) to lift the formula upward so that the nourishing actions could reach the eyes. He added angelica root (*dang gui*) to augment the blood-nourishing action. He also re-introduced the unprocessed rehmannia (*sheng di huang*) that was in Zhang Zhong-Jing's Shen Qi Wan. It combines with the chief to nourish the kidneys and liver, and with the moutan (*mu dan pi*) to clear heat from the blood.

Normally, schisandra (*wu wei zi*) occupies a smaller percentage of a formula than the other ingredients, because, if you are supplementing qi and essence, then you normally don't need to have a strong action to contain the leakage of the qi. Mild astringence suffices. So, it seems that perhaps Fu Ren-Yu is using schisandra fruit a little differently, because in his formula, it is equal to all the other ingredients, except for the chief. And, while it is true that in some early dynasties the ingredients of formulas were often put together in roughly identical proportions, this was certainly not the case during the Ming Dynasty when Fu published his formula. The question is then begged: why is Fu using schisandra fruit (*wu wei zi*) in a larger than normal proportion? Apparently, Fu was aware of the claim by Song Dynasty physicians that schisandra (*wu wei zi*) possessed an action to brighten the eyes;^{vii} Li Gao, the founder of the Earth School, noted that schisandra fruit (*wu wei zi*) had an effect on the pupils.^{viii} This under-utilized direct affect upon the eyes seems to have influenced schisandra's representation in Fu's formula.

The present formulation slightly augments Fu's formula even further. It includes a modification from the Yuan Dynasty (late 13th to mid-14th centuries) with the addition of just two more herbs. By adding lycium fruit (*gou qi zi*) and chrysanthemum flower (*ju hua*) to **Rehmannia Six Formula** (*Liu Wei Di Huang Wan*) you get the formula *Qi Ju Di Huang Wan*, which was indicated for the treatment of dry eyes, excessive tearing, diminished vision, photophobia, and eyestrain. These two additional ingredients both "brighten the eyes," but the chrysanthemum emphasizes a clearing action: clearing the eyes by

draining liver fire and dispersing wind, while the lycium fruit (*gou qi zi*) is strictly nourishing: augmenting the essence, nourishing blood, and tonifying the yin of the kidneys, liver, and lungs.^{ix} The present formula is therefore a combination of Fu's *Ming Mu Di Huang Wan* and *Qi Ju Di Huang Wan*. The final ingredient, tribulus/ puncturevine fruit (*bai ji li*) is a modern modification. It expels wind and is very effective for "brightening the eyes" and treating eye irritation. It can treat itchy eyes and itchy skin from yin and fluid deficiency. Tribulus combines with moutan (*mu dan pi*) to break up blood stasis.

Besides its application for vision issues, this version of **Ming Mu Formula** (*Ming Mu Di Huang Wan*) can be used for tinnitus (when caused by yin deficiency or ascendant yang), weak or sore low back, hips and/or knees, as well as seminal loss.

MODERN APPLICATIONS

There are several formulas, both modern and classical, that are called "Ming Mu" or have "Ming Mu" as part of their name. All of them treat the eyes/vision, but they are not necessarily versions of a common base formula. The studies below have all been chosen because they represent investigations into **Ming Mu Formula** based on *Liu Wei Di Huang Wan*, and therefore are the most applicable to the formula under discussion in this monograph.

Macular Degeneration—It is believed by modern medical research that the pathogenesis of age-related macular degeneration (AMD) likely involves many or all of the following mechanisms in the local area of the retina and maculae: oxidative stress, stress on the endoplasmic reticulum, impaired autophagy, mitochondrial dysfunction, and inflammation. One of the primary structures identified as a major pathological site is the retinal pigment epithelium (RPE). Enhancing local autophagy is regarded by the general ophthalmology community as an essential strategy to protect RPE cells from oxidative damage. A Chinese study published in 2022 investigated whether and to what degree **Ming Mu Formula** (*Ming Mu Di Huang Wan*) was able to relieve oxidative damage by activating local autophagy. They concluded that the *Ming Mu Di Huang* formula "initiates autophagy by activating AMPK/SQSTM1/Keap1 signaling and promotes autophagic flux. Although additional investigation is still needed, the present results may offer basic information about the antioxidative effect of *Ming Mu Di Huang Wan*."^x

The Ophthalmology Department of Affiliated Hospitals of Inner Mongolia University conducted a study comparing the effects of *Ming Mu Di Huang Wan* plus

Conbercept injections to Conbercept injections alone.^{xi} The study was conducted from November 2020 to December 2021. Seventy-two individual eyes were divided into 2 groups of 36. One group was given the injections alone (control) and the other was given the injections plus MMDH formula (study group). After 3 months, the study group showed 12% overall improvement in vision compared to the control group. An additional nearly 12% improvement was seen in the study group compared to the control after 5 months. In addition, the study group showed 11% greater improvement in reduced central macular thickness (CMT) than the control.

A recent review examined over 20 years of studies on the efficacy of Chinese medicine in the treatment of macular degeneration.^{xii} *Ming Mu Di Huang Wan* was found to be among the most commonly prescribed and studied formulas for this condition. It was found among the studies to be especially appropriate for macular degeneration when there was also dry eye, blurred vision, photophobia, and "tears in wind".

Dry Eye Syndrome—A study was published in 2019 that investigated the use of *Ming Mu Di Huang Wan* in conjunction with acupuncture for the treatment of dry eye syndrome.^{xiii} One hundred participants were enrolled in the study; 50 were assigned to the control group, receiving treatment with artificial tears; 50 were part of the test group, receiving acupuncture plus *Ming Mu Di Huang Wan*. After 2 months the two groups were evaluated on 4 study criteria: the Schirmer tear test, tear film breakup time, fluorescent staining, and clinical symptoms score. The results showed an 89% overall improvement in the treatment group compared to 67% in the control. The treatment group scored higher on all 4 test criteria.

Glaucoma—A systematic review of Chinese medicine treatments for glaucoma was published in 2018. The meta-analysis of multiple studies indicated that *Ming Mu Di Huang Wan* could be recommended for support of patients with open-angle glaucoma.^{xiv}

Another study with a more general application, was published in 2016. The study revealed the mechanisms by which *Chi Ju Di Huang Wan*^{xv} was able to protect against retinal ischemia. Retinal ischemia plays a part in retinal vascular occlusion, glaucoma, diabetic retinopathy and age related macular degeneration. The study aimed to evaluate the protective effects and underlying mechanisms of *Chi Ju Di Huang Wan* against retinal ischemia in rats. The researchers found that the formula effectively protected rats from retinal ischemia by downregulating

matrix metalloproteinase-9 and inhibiting p38 mitogen-activated protein kinase.^{xvi}

Retinitis—“Retinitis pigmentosa is a group of heterogeneous inherited photoreceptors’ apoptosis and retinal degeneration disease characterized by constricted visual fields and photoreceptor cell dysfunction.”^{xvii} It is a deficiency inflammatory condition (heat from deficiency) caused by a dystrophic genetic disorder. In Chinese medicine we treat deficiency heat by nourishing yin, particularly kidney yin, and by clearing deficiency heat. Similarly, in order to treat genetic disease, we include support of the kidney in our strategy. **Ming Mu Formula** (*Ming Mu Di Huang Wan*) has been included in a number of studies that highlight natural medicines in the treatment of retinitis pigmentosa. A review article from 2005 took as their interest former studies that investigated the role of decreased blood flow in retinitis pigmentosa.^{xviii} According to their findings the principal formula for treating retinitis pigmentosa with a pattern of kidney and liver yin deficiency was *Ming Mu Di Huang Wan* modified with herbs that invigorate blood flow to the collaterals, such as salvia (*dan shen*) or spatholobus (*ji xue teng*). Another study found that *Ming Mu Di Huang* decoction was able to improve vision and to expand the visual field in participants diagnosed with retinitis pigmentosa.^{xix}

FORMULA COMPARISONS

Ming Mu Formula (*Ming Mu Di Huang Wan*) & **Qi Ju Di Huang Wan**

Both formulas are built from the same base of *Liu Wei Di Huang Wan*, and therefore assume kidney and liver yin deficiency at the root of the issue. Both formulas lift the actions of the base up into the head to bring nourishment to the eyes. The version of **Ming Mu Formula** under present discussion includes *Qi Ju Di Huang Wan*, rendering that particular formula unnecessary when this version of **Ming Mu Formula** (*Ming Mu Di Huang Wan*) is available.

Ming Mu Formula (*Ming Mu Di Huang Wan*) & **Rejuvenation Formula** (*Huan Shao Dan*)

Like **Ming Mu Formula** (*Ming Mu Di Huang Wan*), **Rejuvenation Formula** (*Huan Shao Dan*) rescues declining kidney yin, *jing*/essence, and nourishes blood. But where **Ming Mu Formula** (*Ming Mu Di Huang Wan*) emphasizes the liver along with the kidney, **Rejuvenation Formula** (*Huan Shao Dan*) tonifies spleen qi and kidney yang. Both formulas effectively support weak lumbar, hips, and knees, but **Ming Mu Formula** (*Ming Mu Di Huang Wan*) is, of course specifically formulated to “brighten the eyes” while nourishing the kidney and liver

yin. By contrast, **Rejuvenation Formula** (*Huan Shao Dan*) is stronger for addressing generalized weakness, lack of appetite, emaciation, and impotence.

Ming Mu Formula (*Ming Mu Di Huang Wan*) & **Gastrodia & Uncaria Formula** (*Tian Ma Gou Teng Yin*) Both formulas can treat blurred vision, tinnitus, and glaucoma with an underlying kidney and liver yin deficiency, but the **Gastrodia & Uncaria Formula** (*Tian Ma Gou Teng Yin*) emphasizes liver support over kidney and has a stronger action to extinguish wind. **Gastrodia & Uncaria Formula** (*Tian Ma Gou Teng Yin*) is a better choice when there is dizziness and headache associated with the blurred vision; **Ming Mu Formula** (*Ming Mu Di Huang Wan*) is more nourishing and should be preferred when kidney deficiency dominates the pattern.

Ming Mu Formula (*Ming Mu Di Huang Wan*) & **True Yin Formula** (*Zuo Gui Jia Er Zhi Wan*)

True Yin Formula is the only one in this list of comparisons that is more nourishing than Ming Mu Formula. It contains all three of the tonic substances found in *Rehmannia Six Formula* (*Liu Wei Di Huang Wan*), upon which Ming Mu Formula is built, but only one of the draining substances. It is not specific for “brightening the eyes”, though it does contain some substances with that action. An important distinction between these two formulas is that True Yin Formula, because it has no draining action, and cannot cool blood. Individuals with excess or deficiency fire are cautioned against the use of True Yin Formula, but Ming Mu Formula has safeguards built into the strategy against generating too much heat.

USEFUL COMBINATIONS

When fire from deficiency is pronounced	Combine with Rehmannia & Scrofularia Formula
For tinnitus from liver wind	Combine with Gastrodia & Uncaria Formula
For poor night vision	Combine with Tang Kuei & Salvia Formula
For impotence or premature ejaculation	Combine with Rejuvenation Formula
For cataracts	Combine with Minor Bupleurum Formula

ENDNOTES

ⁱ Another version of the Five Slownesses (wǔ chí) included a shiny, pale complexion, excessive sclera in the eyes, and “insufficiency of spirit,” which may have been a Song Dynasty way of describing autism.

ⁱⁱ The image of the *sanjiao* mechanism being rooted in the spine between the kidneys (at Du-4 *Ming Men*), then rising up the Du channel to branch out from the spine and pour into the back *shu* points has been compared to the image of the Tree of Life.

ⁱⁱⁱ The *fu* organs are under the domain of their respective yin pair. They do not store *jing* but receive support from their associated *zang* pair.

^{iv} Secretions such as hormones are released directly into the venous system (not the arteries).

^v *Essentials of the Materia Medica*, 1664.

^{vi} Note that the Chong and Ren channels both terminate in the eyes.

^{vii} The action of schisandra fruit to “brighten the eyes” was first mentioned by the physician Da Ming in the Song Dynasty.

^{viii} Specifically, Li Gao noted that schisandra fruit (*wu wei zi*) was useful in the treatment of what we today call pupillary mydriasis, the excessive or dysregulated enlargement of the pupils. The pupils are seen as under the domain of the kidney. But the condition is actually a dysregulation of the muscles in the iris, which is governed by the liver. Schisandra tonifies the qi and astringes the essence of both. This action is enhanced by cornus (*shan zhu yu*).

^{ix} The two ingredients (*ju hua* and *gou qi zi*) also comprise a famous two-ingredient longevity formula that is still in wide use today.

^x Chen X, Zhu YJ, Shi XQ, Zuo J, Hu TM, Wu H, Xia Y, Shi W, and Wei W, “Ming-Mu-Di-Huang Pill activates SQSTM1 via AMPK-mediated autophagic KEAP1 degradation and protects RPE cells from oxidative damage”. *Oxidative The Medicine and Cellular Longevity*, 2022;2022(1).

^{xi} Su R, Ran L., Xiao Q, “Mongolian medicine Mingmu-11 Pills combined with Conbercept in the treatment of wet age-related macular degeneration”. *International Eye Science*, 2024;24(5):691-696.

^{xii} Li YA, Liang, L, Li XY, et al., “Traditional Chinese medicine for age-related macular degeneration: A clinical evidence map” between 2000 and 2022”. *Science of Traditional Chinese Medicine*, 2023;1-2,107-114.

^{xiii} Zheng L. and Chen YZ, “The clinical effects of acupuncture combined with Mingmu-Dihuang pill on dry eyes”. *International Journal of Traditional Chinese Medicine*, 2019;(6)820-83.

^{xiv} Yang YX, Ma QY, Yang Y, Chen W, et al., “Evidence-based practice guideline of Chinese herbal medicine for open-angle glaucoma (qingfeng-neizhang)”. *Medicine*, 2018; 97:13(e0126).

^{xv} *Chi Ju Di Huang Wan* contains all of the ingredients present in *Ming Mu Formula* (*Ming Mu Di Huang Wan*).

They differ only in the addition of four that are part of **Ming Mu Formula** but are not present in *Chi Ju Di Huang Wan*. The additional four ingredients are *wu wei zi*, *bai ji li* (*ci ji li*), *sheng di huang*, and *dang gui*.

^{xvi} Cheng JM, Liu XQ, Liu JH, Chao HM, et al., “Chi-Ju-Di-Huang-Wan protects rats against retinal ischemia by downregulating matrix metalloproteinase-9 and inhibiting p38 mitogen-activated protein kinase”. *Chinese Medicine*, 2016;11(39).

^{xvii} Wang DY, Chan WM, Tam PO, et al., “Gene mutations in retinitis pigmentosa and their clinical implications”. *Clinica Chimica Acta*, 2005;351(1-2)5.

^{xviii} Yang YJ, Peng J, Ying D, Peng QH, “A brief review on the pathological role of decreased blood flow affected in retinitis pigmentosa”. *Journal of Ophthalmology*, 2018; <https://doi.org/10.1155/2018/3249064>.

^{xix} Luo X, Zhou Z, Duan J, “Effect of Mingmu Dihuang Decoction on Primary Retinitis Pigmentosa in 28 Cases.” *Hunan Journal of Traditional Chinese Medicine*, 33(05): 75-76.

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