



(Image references in Refs section)

Plant medicine for the treatment of bone-related diseases, focus on osteoporosis and osteoarthritis, an East West Perspective:

Western Definitions:

What is Osteoporosis?

The consistent break-down of porous bone mass leading to increased risk of fractures. This can be caused by diet, prolonged exposure to chemicals, genetics, sickness, lack of exercise, etc.

What is Osteoarthritis?

The wear down of protective cartilage between joints. This can be caused by prolonged repetitive movement(s), diet, genetics, general 'wear & tear', trauma, etc.

Traditional Chinese Medicine Perspective: Relates the onset of osteoporosis and osteoarthritis to an energy imbalance in the Liver (Blood), Spleen, and/or Kidneys, individually or together.

- Liver is the main organ, being the major blood filtration system in the body, that *brings nourishment in the form of Blood* to the tendons/bones/ligaments.
- Spleen, being the major organ of digestion, defines the *quality of Blood* that is produced because of food/drink we ingest.
- Kidney, the main organ of Jing/Essence/born-with vitality, *maintenance and quality of Jing* is the foundation to the production of quality bone marrow.

Osteoporosis Research:

“We conclude that Chinese herbs substantially increased BMD (bone mass density) of the lumbar spine compared to placebo or anti-osteoporotic drugs as indicated in the current clinical reports on osteoporosis treatment.” (Wang, Zhi-qian, et al. 2013)

Curculigo orchoides (CO, common/Chinese name **golden eye-grass**, weevil-wort, xian mao)- “CO ethanol extract has a definite protective effect on bone loss in ovariectomized rats by inhibiting bone resorption and increasing serum phosphorus and calcium levels, without affecting bone formation [33]. In traditional Chinese medicine, CO rhizomes are considered to have the effects of maintaining healthy energy and nourishing the liver and kidneys.” (Wang, Zhi-qian, et al. 2013)

Herba epimedii (common/Chinese name Epimedium, **horny goat weed**, Xian Ling Pi/ Yin Yang Huo)- “contains a plenty of Isoflavone [37]. Isoflavone is also one of the determined substance in most of the recipes. Pharmacological studies, either on murine models of osteoporosis or in vitro, have provided some convincing evidence of positive effects of soya and isoflavones on bone health.” (Wang, Zhi-qian, et al. 2013)

Common Onion- “Rutin, the glycosylated form of quercetin, is abundant in onion... The vitro trails showed that rutin consumption increased femoral strength and trabecular bone density by decreasing bone resorption, although cortical bone density was unchanged.” (Wang, Zhi-qian, et al. 2013)

Puerariae radix (common/Chinese name **Kudzu root**, Ge Gen)- “reversed the bone loss induced by castration, with femur BMD and trabecular number increasing... along with its bone-sparing effect.” (Wang, Zhi-qian, et al. 2013)

Other significant plants/herbs in this systematic review: (Wang, Zhi-qian, et al. 2013)

*systematic reviews are considered one of the top ‘golden’ standards in research, as it weans out insignificant or ‘outliner’ studies

- Eucommia bark
- Ligustrum lucidum
- Rhizoma Drynariae

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- Achyranthes bidentate
- Cibotium barometz (wolly fern)

Red sage root- “The review highlights the anti-osteoporotic potential of **Salvia miltiorrhiza** in clinical applications and the potential of the herb to provide potent compounds targeting specific pathways in bone resorption and bone formation.” (Guo, Yubo, et al. 2014)

Soy- “There are several mechanisms for anti-osteoporosis effects. Estrogen-like effects, especially soy phytoestrogenic compounds and other herbal compounds and formulations, can enhance bone formation markers, as well as antioxidant and anti-inflammatory capacity, while decreasing bone resorption biomarkers. Therefore, they can be used as complementary medicine for osteoporosis, especially in postmenopausal older women.” (Habibi Ghahfarrokhi, Shahrzad, and Roya Reisi, 2019)

“We observed the release of markers and anti-inflammatory mediators after treatment with plants, which accelerated the recovery process of bone repair.” & “this study demonstrated that the use of **plant extracts** stimulates bone repair, increasing osteogenesis, the rate of calcification, and the formation and mineralization of bone callus, accelerating the process of new bone formation on the fracture region. Possibly, these effects are related to anti-inflammatory and antioxidant power of these extracts.” (Miranda, Lyvia Lopes, et al. 2019)

Osteoarthritis (OA) Research:

“Although the effect size was small, the meta-analysis revealed that **rosehip powder** does reduce pain and results in a statistically significant reduction in the use of analgesics.” (Mobasheri, Ali. 2012)

Pure form Turmeric for prevention- “three major **curcuminoids** was found to be efficacious in preventing joint inflammation when treatment was started before, but not after, the onset of joint inflammation.” (Mobasheri, Ali. 2012)

Resveratrol found in grapes, berries, and peanuts- “These results suggest the use of resveratrol as an herbal medicine for treatment of OA.” (Mobasheri, Ali. 2012)

Resveratrol combined with turmeric- “On the basis of these results, we have proposed that combining these natural compounds may be a more useful strategy in developing herbal medicines than using the individual compounds alone.” (Mobasheri, Ali. 2012)

GCSB-5 (Shinbaro®; Green Cross Corp., Yongin, Korea) is a medicine prepared from **six herbs**,

“The result of this study supports that GCSB-5 is comparable to Celecoxib in terms of the efficacy and safety for the treatment of osteoarthritis of knee joint.” (Park, Yong-Geun, et al. 2013)

I. **Siler root** (Ledebouriellae Radix)

- II. **Achyranthes root** (Achyranthis Radix)
- III. **Acanthopanax bark** (Acanthopanax Cortex)
- IV. **Chain fern rhizome** (Cibotii Rhizoma)
- V. **Soya bean** (Glycine Semen)
- VI. **Eucommia bark** (Eucommiae Cortex)

Kidney-Tonifying and Blood-activating Chinese herbs (KTBAMs) - "KTBAMs appear to be as effective as NSAIDs and seem to have an add-on effect to NSAIDs for the treatment of KOA (Knee Osteoarthritis)." (Huang, Hetao, et al. 2019) *Table 2 for herbs

Table 2: (Huang, Hetao, et al. 2019)

Top 20 Chinese herbs and efficacy based on frequency of usage in the 38 study prescriptions.

Kidney-tonifying herbs

Achyranthes Root	<i>Radix achyranthis bidentatae</i>	Niuxi	24
Prepared Radix Rehmanniae	<i>Radix rehmanniae preparata</i>	Shudihuang	18
Malaytea Scurfpea Fruit	<i>Fructus psoraleae</i>	Buguzhi	14
Eucommia bark	<i>Cortex eucommia</i>	Duzhong	13
Chinese Taxillus Twig	<i>Herba taxilli</i>	Sangjisheng	13
Drynaria Fortunei	<i>Rhizoma drynariae</i>	Gusuibu	13
Epimedium herb	<i>Herba epimedii</i>	Yinyanghuo	10
Common Macroparium Fruit	<i>Fructus corni</i>	Shanzhuyu	7
Prepared common Monkshood Daughter Root	<i>Radix Aconiti Lateralis Preparata</i>	Fuzi	7

Blood-activating herbs

Achyranthes Root	<i>Radix achyranthis bidentatae</i>	Niuxi	24
Chinese Angelica	<i>Radix angelicae sinensis</i>	Danggui	20
Suberect Spatholobus Stem	<i>Caulis spatholobi</i>	Jixueteng	14
Danshen Root	<i>Radix salviae miltiorrhizae</i>	Danshen	11
Szechwan Lovage Rhizome	<i>Rhizoma chuanxiong</i>	Chuanxiong	10

Pain relief

Doubleteeth Pubescent Angelica Root	<i>Radix angelicae pubescentis</i>	Duhuo	10
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Clematis Root	<i>Radix clematidis</i>	Weilingxian	10
White Peony Root	<i>Radix paeoniae alba</i>	Baishao	9
Common Flowering Quince Fruit	<i>Fructus chaenomelis</i>	Mugua	9
<i>Others</i>			
Licorice Root	<i>Radix glycyrrhizae</i>	Gancao	16
Astragalus	<i>Radix astragalus</i>	Huangqi	10
Wolfiporia Extensa	<i>Poria cocos</i>	Fuling	7

Refs:

Image references:

Skeleton- <https://www.amazon.ca/Sapiens-Human-Skeleton-Vintage-Drawing/dp/B07K5HBSRB>

Herbs and bottles- © 2017 WAKUNAGA OF AMERICA CO., LTD. <https://kyolic.com/benefits-of-herbal-medicine/>

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