

**A COMPOSITION SUITABLE FOR VEGETARIANS PROVIDING CALCIUM
SUPPLEMENTATION AS WELL AS GOUT PREVENTION AND
TREATMENT AND THE METHOD OF PREPARATION THEREOF**

5 FIELD OF INVENTION

The invention combines modern science theory and Chinese medicine theory to create a composition with the method of preparation thereof that is capable of providing calcium supplementation, and treating and preventing gout that is suitable for vegetarians. Particularly, the calcium supplement composition is formulated for
10 vegetarians.

BACKGROUND OF THE INVENTION

With the improvement of material's well-being, human's spiritual life and cultural qualities are changing. For example, the acceptance towards vegetarian diet is
15 increasing. However, many vegetarians do not practice a proper vegetarian diet. Imbalanced nutrition or overly selective diet can lead to malnutrition or calcium deficiency. Thus, one's health can be affected. Many fruits and vegetables contain high content of phytic acid, oxalic acid, and cellulose, which can disturb the absorption of calcium in gastrointestinal tract. Disturbed calcium absorption is the
20 main cause of long-term calcium deficiency in vegetarians. Calcium deficiency increases the risk of developing diseases such as rheumatism, rheumatoid arthritis, osteoporosis, cramps, numbness, weakness, and insomnia. Vegetarians should be aware of their diet to ensure sufficient intake and absorption of dietary calcium or if diet falls short of calcium, they can opt for calcium supplement.

25 Many people are becoming vegetarian for health or personal reasons. Although a vegetarian lifestyle may offer many advantages, it may increase the risk of developing hyperuricemia if the diet is high-purine or high-fat. Asparagus, beans, peas, lentils, spinach, broccoli, and mushrooms are some examples of high-purine food. Cooking

oils that are high in fat may be used excessively during cooking to make the food delicious. Gout is a medical condition associated with the disorder of purine metabolism or reduced renal excretion of uric acid, which both can lead to high level of uric acid in blood. The excessive uric acid crystallizes in the form of monosodium urate that will deposit in joints. Subsequently, a local immune-mediated inflammatory reaction will be triggered that causes pain and leads to joint swelling and deformity. The affected joints are usually big toes, heels, and knees but chronic gout patients can experience pain in finger joints or even soft tissue in ears. A body part that is affected by acute gout will become red, swollen, hot, and intensely painful. It usually happens during midnight and may interrupt sleep. Given these circumstances, a composition for gout treatment that is safe and has minimal side effect should be developed for vegetarians.

SUMMARY OF THE INVENTION

The invention aims to provide a composition for fabrication of a calcium supplement. More precisely, the composition also provides essential nutrients for metabolic processes that make the effect more comprehensive.

Another object of the invention is to offer a rational and effective calcium supplement with simple processing method, explicit functional components, and minimal side effects for vegetarians to prevent and treat gout, and relief knee joint pain.

At least one of the preceding objects is met, in whole or in part, by the present invention, in which one of the embodiments of the present invention includes a composition for calcium supplementation and gout prevention comprising a mixture of calcium L-aspartate, soybean extract, methyl-sulfonyl-methane (MSM), lecithin, and any one or a combination of *Sambucus williamsii* Hance and *Drynaria fortunei* (Kunze) J. Sm.

Further, the composition may comprise any one or a combination of *Morinda officinalis* extract, *Epimedium grandiflorum* extract, and turmeric root extract.

In the preferred embodiment of the present invention, the percentage by weight of total composition for calcium L-aspartate is 10% to 70%; soybean extract is 5% to 20%; methyl-sulfonyl-methane (MSM) is 10% to 30%; lecithin is 5% to 20%; *Sambucus williamsii* Hance is 5% to 40%; and *Drynaria fortunei* (Kunze) J. Sm is 5% to 40%.

Further, the percentage by weight of total composition for *Morinda officinalis* extract is 5% to 40%; *Epimedium grandiflorum* extract is 5% to 40%; and turmeric root extract is 5% to 40%.

In a more preferred embodiment of the present invention, the composition comprises a mixture of, by weight of total composition, 10% to 70% of calcium L-aspartate; 5% to 20% of soybean extract; 10% to 30% of methyl-sulfonyl-methane (MSM); 5% to 20% of lecithin; 5% to 40% of *Morinda officinalis* extract; 5% to 40% of *Epimedium grandiflorum* extract; 5% to 40% of *Sambucus williamsii* Hance; 5% to 40% of *Drynaria fortunei* (Kunze) J. Sm; and 5% to 40% of turmeric root extract.

In the most preferred embodiment, the composition for calcium supplementation and gout prevention comprises a mixture of, by weight of total composition, 40% of calcium L-aspartate; 12% of soybean extract; 15% of methyl-sulfonyl-methane (MSM); 8% of lecithin; 5% of *Morinda officinalis* extract; 5% of *Epimedium grandiflorum* extract; 5% of *Sambucus williamsii* Hance; 5% of *Drynaria fortunei* (Kunze) J. Sm; and 5% of turmeric root extract.

In accordance with the preferred embodiment, the mixture is sieved and fabricated into a dosage form by performing granulation, filling, or tableting process. Preferably, the dosage form comprises 0.10g to 1.50g of the mixture.

Preferably, the dosage form is tablet, sugar-coated tablet, film-coated tablet, plant-based hard-shelled capsule, enteric-coated capsule, granule, enteric-coated tablet, pill, or powder.

DETAILED DESCRIPTION OF THE INVENTION

It is to be understood that the present invention may be embodied in other specific forms and is not limited to the sole embodiment described herein. However, modification and equivalents of the disclosed concepts such as those which readily occur to one skilled in the art are intended to be included within the scope of the claims which are appended thereto.

Calcium is one of the most important minerals for the human body. 99% of the calcium in human body is found in bone while the remaining 1% is found in blood or soft tissues. Most of the calcium supplements available in the market are derived from animals. Hence, the calcium supplements are not suitable for vegetarians. Moreover, vegetarians should be watchful over their diet to ensure sufficient intake and absorption of dietary calcium or if the diet falls short of calcium, they can opt for calcium supplement.

The present invention offers a rational, effective, and safe calcium supplement with simple formulation. It can prevent vegetarians from having calcium deficiency by replenishing calcium and treat diseases caused by calcium deficiency. The invention offers a comprehensive health effect by replenishing calcium ion that is needed by the human body and providing essential nutrients for human metabolic process to take place.

The composition embodied herein mainly comprises a mixture of calcium L-aspartate, soybean extract, methyl-sulfonyl-methane (MSM), lecithin, and any one or a combination of *Sambucus williamsii* Hance and *Drynaria fortunei* (Kunze) J. Sm.

In one aspect, the composition may comprise any one or a combination of *Morinda officinalis* extract, *Epimedium grandiflorum* extract, and turmeric root extract.

In the preferred embodiment of the present invention, the mixture comprises 10% to 70% of calcium L-aspartate by weight of total composition. Calcium L-aspartate serves as a calcium source and it is incorporated in the unique herbal formulation to increase its bioavailability and enhance mineral absorption. It is compatible with other functional ingredients. Hence, the formula does not hurt the gastrointestinal tract and will not cause excessive heat in the body, making it suitable for vegetarians. The

invention highlights the ratio of calcium L-aspartate used in combination with other ingredients aforementioned. Such unique formulation offers comprehensive balancing of the calcium supplementation effect. Meanwhile, soybean extract and lecithin are included in the formulation to promote calcium absorption. The soybean extract is able to increase the rate of calcium absorption in the intestinal tracts while the lecithin reduces fat to increase calcium absorption. Preferably, soybean extract constitutes 5% to 20% by weight of total composition and lecithin constitutes 5% to 20% by weight of total composition.

According to the preferred embodiment of the present invention, the mixture comprises 10% to 30% of methyl-sulfonyl-methane (MSM) by weight of total composition. The invention further involves methyl-sulfonyl-methane (MSM, also known as organic sulfur) to facilitate the synthesis of collagen. Sulfur element is an important mineral in the construction of a human body. Nails, hair, skin, internal organs, connective soft tissues, and etcetera are rich in sulphur compound. Furthermore, muscle tissues are constructed from sulfur-rich protein, which is one of the required components by the human body. Besides, sulfur is also a key mineral in cartilage synthesis. The sulfur content in an osteoarthritis patient's cartilage is usually only one-third of the sulphur content found in a healthy individual's cartilage. The cartilage between joints is composed of collagen in which MSM can serve as an essential component during collagen synthesis.

Nine unique ingredients in the composition of the present invention are specially formulated for vegetarians to rebuild bones to a healthy state. It is strongly recommended for its high reactivity and effective absorption by the human body. According to research, a vegetarian diet can contain six to eight times higher content of phytate, oxalate, and phosphate than the calcium content. They can form insoluble calcium salt and interfere with calcium absorption, causing an imbalanced diet. Results showed that most vegetarians suffer from different degrees of malnutrition. As an example, a long-term vegetarian may have insufficient dietary intake of protein and cholesterol to meet the body needs. Calcium supplements that are derived from

natural plants have high absorption rate and are effective in increasing bone density and maintaining bone health.

The MSM organic sulphur presents in this invention is important in bone density improvement. Moreover, the MSM helps a body to absorb minerals more readily, which the minerals are contained in the supplement of the present invention and daily food intake. MSM also promotes and improves joint mobility. Lastly, MSM helps vegetarians by supplementing calcium that repairs bones as well as cartilages and bone collagens; the bone and joint health will be improved. Hence, a supplement that contains both MSM and calcium will be better than a supplement that contains calcium alone because the presence of MSM will aid in the strengthening and protection of bones and joints further.

Preferably, the invention contains *Morinda officinalis* extract, *Epimedium grandiflorum* extract, *Sambucus williamsii* Hance, *Drynaria fortunei* (Kunze) J. Sm, and turmeric root extract. The ingredients with a reasonable ratio can produce a synergistic effect, and replenish vitamins and trace elements that are absent or insufficient in a vegetarian diet. At the same time, the ingredients provide nutrients for bones and joints, delivering a pronounced effect on bone health care.

Morinda officinalis extract may present in the mixture at 5% to 40% by weight of total composition. In traditional Chinese medicine, *Morinda officinalis* extract is used to strengthen bones, nourish kidneys, disperse swelling, relieve pain, and treat osteoporosis and femoral head necrosis. It has a pronounced anti-inflammatory effect and can be used to treat arthritis, promote bone synthesis, reduce osteolysis, and prevent osteoporosis, which arthritis, osteolysis, and osteoporosis can lead to bone fracture.

The mixture may comprise 5% to 40% of *Epimedium grandiflorum* extract by weight of total composition. *Epimedium grandiflorum* extract has the function of nourishing kidneys, enhancing sexuality, and strengthening bones. It contains active compounds that promote proliferation and differentiation of osteoblast. Therefore, it can be used to prevent and treat acute and chronic gouty arthritis. Lastly, *Epimedium grandiflorum*

extract is also useful and plays an extensive role in cardiovascular system, central nervous system, blood circulatory system, immune system, osteoporosis prevention, anti-inflammation, and anti-aging.

Preferably, the mixture comprises 5% to 40% of *Sambucus williamsii* Hance by weight of total composition. *Sambucus williamsii* Hance has analgesic and anti-inflammatory effects. It is mainly used to treat rheumatoid arthritis, bruises, bone fractures, gout, Kashin-Beck disease, and oedema. In Europe, it is used to treat plethora caused by arthritis, asthma, cold, and constipation.

In the preferred embodiment of the present invention, the mixture comprises 5% to 40% of *Drynaria fortunei* (Kunze) J. Sm by weight of total composition. *Drynaria fortunei* (Kunze) J. Sm, also known as *Drynaria roosii*, has the function of nourishing kidneys and strengthening bones. It is usually used to treat kidney deficiency, lower back pain, tinnitus, deafness, loose teeth, muscle sprain, and bone fracture. It is also effective against diabetes, obesity, hyperuricemia, osteoporosis, impaired glucose tolerance, and postprandial hyperglycemia. Modern research found that *Drynaria fortunei* (Kunze) J. Sm promotes proteoglycan synthesis, improves bone absorption of calcium, increases blood calcium and phosphorus level, aids bone calcification, facilitates bone fracture healing, and delays bone cell degeneration.

In accordance with the preferred embodiment, the mixture may comprise 5% to 40% of turmeric root extract by weight of total composition. In traditional Chinese medicine, turmeric root extract is used to treat chest pain, shoulder and arm pain caused by rheumatoid arthritis, and pain caused by joint swelling. Studies showed that turmeric has anti-gout properties and it inhibits the enzymatic activity of α -glucosidase. It also helps in reducing serum uric acid by inhibiting production of uric acid and promoting uric acid excretion.

More preferably, the present invention includes a composition for calcium supplementation and gout prevention comprising a mixture of, by weight of total composition, 10% to 70% of calcium L-aspartate; 5% to 20% of soybean extract; 10% to 30% of methyl-sulfonyl-methane (MSM); 5% to 20% of lecithin; 5% to 40% of

Morinda officinalis extract; 5% to 40% of *Epimedium grandiflorum* extract; 5% to 40% of *Sambucus williamsii* Hance; 5% to 40% of *Drynaria fortunei* (Kunze) J. Sm; and 5% to 40% of turmeric root extract.

Most preferably, the composition for calcium supplementation and gout prevention
 5 comprises a mixture of, by weight of total composition, 40% of calcium L-aspartate; 12% of soybean extract; 15% of methyl-sulfonyl-methane (MSM); 8% of lecithin; 5% of *Morinda officinalis* extract; 5% of *Epimedium grandiflorum* extract; 5% of *Sambucus williamsii* Hance; 5% of *Drynaria fortunei* (Kunze) J. Sm; and 5% of turmeric root extract.

10 Pursuant to the preferred embodiment of the present invention, the mixture is sieved and fabricated into a dosage form by performing granulation, filling, or tableting process. Preferably, the dosage form comprises 0.10g to 1.50g of the mixture in the form of tablet, sugar-coated tablet, film-coated tablet, plant-based hard-shelled capsule, enteric-coated capsule, granule, enteric-coated tablet, pill, or powder.

15 The recommended intake is two to three times daily, 2 dosages each time. Preferably, it is ingested with warm water.

The composition of the present invention can be used to increase the strength of connective tissue, improve joints and bones, relieve muscle and joint pain caused by arthritis, prevent rheumatoid arthritis and inflammatory joint degeneration, contribute
 20 to ligament and joint health, improve nail and hair growth, and lastly, ameliorate arthritis.

The present invention offers a calcium supplement composition suitable for vegetarians that can strengthen bones and joints, increase bone mass, improve calcium absorption and deposition on bones and joints, nourish kidneys, benefit bones and
 25 tendons, enhance bone metabolism, regulate bone cells, maintain strong bones, tendon health, and bone density, improve joint mobility, reduce joint stiffness, joint cracking, back pain, and cramp, and alleviate weaknesses. The composition also helps in relieving bone and joint discomfort, soothing bone and joint injury, and recovering

from osteoporosis and bone fractures. Furthermore, the composition has pronounced anti-inflammatory, analgesic, and gout prevention effects.

The composition of the present invention offers advantages such as vegetarian suitability, bone loss reduction, high minerals absorption enhancement that the
5 minerals are contained in the supplement of the present invention and daily food intake, calcium supplementation, and bone filing. Furthermore, the composition is unaffected by gastric acid and aids in forming strong bone and teeth. Besides, the composition also contains special ingredients that delay cartilage deterioration resulted from osteoarthritis, and reduce cholesterol and replenish calcium to relieve
10 joint inflammation. It also improves nails and hair growth.

Accordingly, the present invention provides a composition with new formulation that is suitable for the general public including vegetarians. The composition comprises plant-derived calcium and a unique herbal formulation to increase bio-availability, mineral absorption, and compatibility between the functional components. Hence, the
15 calcium supplement composition is preferred by and suitable for vegetarians.

The present disclosure includes as contained in the appended claims, as well as that of the foregoing description. Although this invention has been described in its preferred form with a degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in
20 the details of construction and the combination and arrangements of parts may be resorted to without departing from the scope of the invention.

CLAIMS

1. A composition for calcium supplementation and gout prevention comprising a mixture of calcium L-aspartate, soybean extract, methyl-sulfonyl-methane (MSM), lecithin, and any one or a combination of *Sambucus williamsii* Hance and *Drynaria fortunei* (Kunze) J. Sm.
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2. A composition according to claim 1, wherein the mixture further comprises *Morinda officinalis* extract.
3. A composition according to claim 1, wherein the mixture further comprises *Epimedium grandiflorum* extract.
- 10 4. A composition according to claim 1, wherein the mixture further comprises turmeric root extract.
5. A composition according to claim 1, wherein the mixture comprises 10% to 70% of calcium L-aspartate by weight of total composition.
6. A composition according to claim 1, wherein the mixture comprises 5% to
15 20% of soybean extract by weight of total composition.
7. A composition according to claim 1, wherein the mixture comprises 10% to 30% of methyl-sulfonyl-methane (MSM) by weight of total composition.
8. A composition according to claim 1, wherein the mixture comprises 5% to 20% of lecithin by weight of total composition.
- 20 9. A composition according to claim 1, wherein the mixture comprises 5% to 40% of *Sambucus williamsii* Hance by weight of total composition.
10. A composition according to claim 1, wherein the mixture comprises 5% to 40% of *Drynaria fortunei* (Kunze) J. Sm by weight of total composition.
- 25 11. A composition according to claim 2, wherein the mixture comprises 5% to 40% of *Morinda officinalis* extract by weight of total composition.

12. A composition according to claim 3, wherein the mixture comprises 5% to 40% of *Epimedium grandiflorum* extract by weight of total composition.
13. A composition according to claim 4, wherein the mixture comprises 5% to 40% of turmeric root extract by weight of total composition.
- 5 14. A composition according to claim 1, wherein the mixture is sieved and fabricated into a dosage form by performing granulation, filling, or tableting process.
15. A composition according to claim 14, wherein the dosage form comprises 0.10g to 1.50g of the mixture.
- 10 16. A composition according to Claim 15, wherein the dosage form is tablet, sugar-coated tablet, film-coated tablet, plant-based hard-shelled capsule, enteric-coated capsule, granule, enteric-coated tablet, pill, or powder.
- 15 17. A composition for calcium supplementation and gout prevention comprising a mixture of, by weight of total composition, 10% to 70% of calcium L-aspartate; 5% to 20% of soybean extract; 10% to 30% of methyl-sulfonyl-methane (MSM); 5% to 20% of lecithin; 5% to 40% of *Morinda officinalis* extract; 5% to 40% of *Epimedium grandiflorum* extract; 5% to 40% of *Sambucus williamsii* Hance; 5% to 40% of *Drynaria fortunei* (Kunze) J. Sm; and 5% to 40% of turmeric root extract.
- 20 18. A composition according to claim 17, wherein the mixture is sieved and fabricated into a dosage form by performing granulation, filling, or tableting process.
19. A composition according to claim 18, wherein the dosage form comprises 0.10g to 1.50g of the mixture.
- 25 20. A composition according to Claim 19, wherein the dosage form is tablet, sugar-coated tablet, film-coated tablet, plant-based hard-shelled capsule, enteric-coated capsule, granule, enteric-coated tablet, pill, or powder.

21. A composition for calcium supplementation and gout prevention comprising a mixture of, by weight of total composition, 40% of calcium L-aspartate; 12% of soybean extract; 15% of methyl-sulfonyl-methane (MSM); 8% of lecithin; 5% of *Morinda officinalis* extract; 5% of *Epimedium grandiflorum* extract; 5% of *Sambucus williamsii* Hance; 5% of *Drynaria fortunei* (Kunze) J. Sm; and 5% of turmeric root extract.
22. A composition according to claim 21, wherein the mixture is sieved and fabricated into a dosage form by performing granulation, filling, or tableting processes.
23. A composition according to Claim 22, wherein the dosage form comprises 0.10g to 1.50g of the mixture.
24. A composition according to Claim 23, wherein the dosage form is tablet, sugar-coated tablet, film-coated tablet, plant-based hard-shelled capsule, enteric-coated capsule, granule, enteric-coated tablet, pill, or powder.