

Review Article

A REVIEW ON HERBAL REMEDIES FOR VARICOSE VEINS: PHARMACOLOGICAL PERSPECTIVES AND THERAPEUTIC POTENTIAL

Author: Poorana Pushkalai Saravanan¹*, Dhanusri Natarajan², Gayathiri Muthusamy³, Jeevanantham Arasakumar⁴, Aarthi Dhavaseelan⁵

^{1,2,3,4,5}Department of Pharmacology, Swamy Vivekananda College of Pharmacy, Tiruchengode, Namakkal (Dt)- 637 205.

Affiliated to The Tamil Nadu Dr. MGR Medical University, Chennai- 600032, India.

KEYWORDS:

Varicose veins, Chronic venous insufficiency, Venotonic, Anti-inflammatory, Antioxidant, Microcirculation

ARTICLE HISTORY

Received Date: 05/01/2026

Revised Date: 07/01/2026

Accepted Date: 23/01/2026

Published Date: 09/03/2026

DOI: 10.69557/2czdkk06

CORRESPONDING AUTHOR

Poorana Pushkalai Saravanan

pooranapushkalai94@gmail.com

ABSTRACT

Varicose veins, a common manifestation of chronic venous insufficiency (CVI), are characterized by dilated, twisted, tortuous superficial veins resulting from venous hypertension and valvular incompetence. These abnormalities impair venous return, leading to symptoms such as pain, swelling, heaviness, itching, and, in severe cases, ulceration, thereby significantly reducing quality of life. The pathophysiology of Varicose Veins is multifactorial, involving oxidative stress, chronic inflammation, endothelial dysfunction, and increased activity of matrix metalloproteinases, which collectively contribute to vascular remodeling and the loss of venous elasticity. Epidemiological factors such as advancing age, female sex, pregnancy, obesity, and lifestyle influences play a significant role in the development of varicose veins. The present article aims to review various natural herbs used in the treatment and management of this condition. Herbal agents such as *Ruscus aculeatus*, *Centella asiatica*, *Aesculus hippocastanum*, *Allium sativum*, *Collinsonia canadensis*, *Zingiber officinale*, *Ginkgo biloba*, *Agrimonia eupatoria*, citrus fruits and herbal oils possess diverse pharmacological activities, including anti-inflammatory, antioxidant, Venotonic, vasodilatory, and anti-edematous effects. These bioactive properties help improve venous tone, enhance microcirculation, reduce capillary permeability, and alleviate associated symptoms. Overall, herbal medicine represents a promising, cost-effective, and safer therapeutic strategy for the management of varicose veins. However, further well-designed clinical studies and standardization of herbal formulations are required to establish their efficacy and safety for widespread clinical use.

INTRODUCTION

Varicose Veins are tortuous, dilated, and twisted superficial veins involving the saphenous veins, their tributaries, or non-saphenous veins of the lower extremities. (**Fig 1**) Advancing age and family history are important risk factors in their development. However, vein size alone does not necessarily indicate abnormality, as it may vary with ambient temperature and hormonal influences, particularly in women. In addition, superficial veins may appear prominent in thin individuals, whereas varicosities may be less apparent in obese individuals.^[1]

Varicose Veins and Chronic Venous Insufficiency (CVI) are collectively classified as chronic venous disorders, encompassing a wide range of structural and functional abnormalities of the venous system. CVI of the lower extremities primarily arises due to venous hypertension and is characterized by symptoms such as pain, heaviness, swelling, itching, burning sensation, and, in severe cases, leg ulcers. The normal functioning of the venous system depends on efficient muscular pumps and competent venous valves that facilitate the upward flow of blood against gravity, directing it from superficial veins to the deep venous system and toward the central circulation. When these valves become incompetent, retrograde blood flow occurs, leading to venous reflux, blood pooling, and increased venous pressure. This pathological process results in vein dilation, vascular remodelling, and the progression of venous insufficiency. Clinically, patients commonly experience heaviness, swelling, aching, pain, muscle cramps, restless legs, itching, and tingling sensations, all of which significantly impair quality of life. In recent years, there has been growing interest in the use of medicinal plants and natural compounds for managing CVI and varicose veins, owing to the pharmacological activities of their bioactive constituents. These phytochemicals exhibit anti-inflammatory, antioxidant, venotonic (vitamin P-like), and anti-oedematous effects, which contribute to improved venous tone, enhanced microcirculation, and reduced capillary permeability.^[2] This review focuses on the pharmacological perspectives and therapeutic potential of natural herbs used in the treatment and management of varicose veins.

Epidemiology

Varicose Veins are influenced by multiple demographic and environmental factors. Reported risk factors include female sex, advancing age, pregnancy, family history, race, occupation, obesity, and dietary habits. Among these, increasing age, multiple pregnancies, and Caucasian ethnicity are considered the most consistently supported risk factors.^[3,4] Epidemiological studies generally indicate a higher prevalence in women, with a female-to-male ratio ranging from 1.5:1 to 3:1; however, some studies have reported comparable incidence rates between genders, suggesting variability in findings.

Large population-based investigations, such as the Edinburgh Vein Study, have identified only weak associations between lifestyle factors such as prolonged standing, straining, and height and the development of superficial venous reflux.^[5,6] Overall, the contribution of these factors remains inconclusive due to inconsistent evidence across studies. It has been estimated that a significant proportion of the adult population exhibits minor venous disorders, while clinically visible varicose veins are observed in approximately 20–25% of women and 10–15% of men.^[8]

Pathophysiology

The pathogenesis of Varicose Veins is complex and multifactorial, involving hemodynamic, biochemical, and inflammatory mechanisms. Key contributing factors include venous hypertension, increased capillary permeability, chronic oedema, and impaired venous return.^[8] Dysfunction of venous valves leads to reflux of blood, resulting in venous stasis, increased pressure, and progressive vein dilation, particularly in the

lower extremities. Oxidative stress plays a central role in disease progression, characterized by reduced antioxidant capacity and excessive production of Reactive Oxygen Species (ROS). This imbalance contributes to endothelial dysfunction and loss of vascular elasticity. In addition, chronic inflammation mediated by pro-inflammatory cytokines further promotes vascular damage and remodelling. Venous stasis and tissue hypoxia exacerbate metabolic disturbances, leading to ATP depletion and increased generation of free radicals through enzymatic pathways involving xanthine oxidase. Furthermore, elevated levels of matrix metalloproteinases (MMPs), including elastase and collagenase, have been observed in patients with varicose veins. These enzymes degrade structural components of the vascular wall, contributing to loss of venous integrity and progression of chronic venous insufficiency. Collectively, these mechanisms result in structural and functional alterations of the venous system, ultimately leading to the clinical manifestations of varicose veins.^[2]

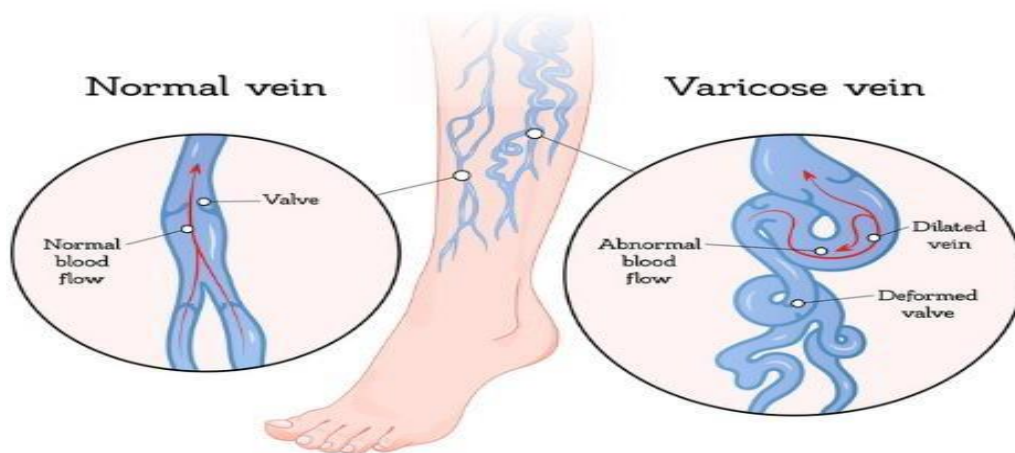


Figure.no 1: Comparison of Normal and Varicose Veins

Herbal plants used in the treatment of Varicose Veins:

A wide variety of medicinal plants are found across the world, many of which possess significant therapeutic potential. Even common weeds contain bioactive compounds useful in treating various diseases. India is well known for its rich tradition of herbal medicine and natural remedies derived from ancient healing.

Ruscus aculeatus (Butcher's broom)



Figure.no 2: *Ruscus aculeatus* (Butcher's Broom) Plant

Family: Liliaceae

Part used: Root (rhizome)

Taste/smell: Soapy taste

Dosage: Decoction of 1 teaspoon per cup of water or 5–30 drops of liquid extract, taken 1–3 times daily with water.

Ruscus aculeatus (butcher's broom)(**Fig 2**) is a medicinal plant native to the Mediterranean regions of Europe and Africa and is widely used in the management of Chronic Venous Insufficiency (CVI), Varicose Veins, hemorrhoids, and orthostatic hypotension. Its therapeutic activity is primarily attributed to the steroidal saponins ruscogenin and neoruscogenin, which exhibit potent venotonic and vasoconstrictive properties. Extracts of the rhizome have been extensively used for the oral treatment of lower limb edema associated with CVI.^[30] Pharmacologically, *Ruscus aculeatus* reduces venous hypertension through α_1 - and α_2 -adrenergic receptor-mediated vasoconstriction in the vascular wall and inhibits histamine-induced increases in vascular permeability. It also demonstrates anti-elastase activity, thereby preserving vascular integrity, and exerts anti-inflammatory effects by modulating adhesion molecule expression and reducing leukocyte migration. Experimental studies (in vitro, ex vivo, and in vivo) have shown that the extract acts on veins, capillaries, and lymphatic vessels, improving microcirculation and reducing edema. Clinical studies involving combination therapies with hesperidin and vitamin C have reported significant reductions in pain, muscle cramps, and lower extremity swelling. Furthermore, the extract exhibits pleiotropic effects, including modulation of calcium ion mobilization, which plays a role in the pathophysiology of CVI. ^[9]

Centella asiatica L. (Gotukola)



Figure.no 3: Centella asiatica L. (Gotu Kola) Plant

Family: Umbelliferae(Parsley family)

Part used: whole plant

Taste/smell: spicy, fragrant

Dosage: 1 tablespoon per cup of water as infusion, or 20- 60 drops of 1:1 fresh liquid extract, taken 1-4 times daily.

Centella asiatica L. (Gotu kola) (**Fig 3**) is a traditional medicinal plant widely used in India, China, and Indonesia for the management of various diseases. It is often referred to as the “fountain of life” due to its wide therapeutic applications, including treatment of ulcers, fatigue, epilepsy, fever, and respiratory disorders. In the management of Chronic Venous Insufficiency (CVI), *Centella asiatica* has demonstrated significant therapeutic benefits. Studies have reported improvement in microcirculatory parameters,

including reduced capillary permeability, decreased ankle oedema, and improved venoarteriolar response.^[10] Patients treated with its extracts show marked relief in symptoms such as leg heaviness, pain, and swelling. The therapeutic effects are mainly attributed to its triterpenoid constituents, which enhance collagen synthesis and support connective tissue remodelling.^[11] These compounds stimulate fibroblast activity and strengthen the venous wall, thereby improving vascular integrity and venous function.^[12]



Aesculus hippocastanum L (Horse chestnut)

Figure.no 4: *Aesculus hippocastanum* L. (horse chestnut)

Family: Hippocastanaceae

Part used: Ripe seeds (chestnut) and bark

Taste/Smell: Bitter, slightly pungent

Dosage: 1–5 drops of 1:5 dry liquid extract, taken 1–3 times daily in a small amount of water.

Aesculus hippocastanum L. (horse chestnut) (**Fig 4**) seed extract, standardized for aescin, is widely used in the management of Chronic Venous Insufficiency (CVI). It is well known for its venotonic, anti-inflammatory, and anti-oedematous properties, and its efficacy has been demonstrated in several clinical trials.^[9] Horse chestnut extract has shown effectiveness comparable to compression therapy and standard venotonic drugs in relieving venous symptoms. Its primary active compound, aescin, inhibits phospholipase A2, thereby reducing the release of inflammatory mediators and enzymes such as elastase, collagenase, and hyaluronidase. This leads to decreased vascular permeability, reduced inflammation, and improved venous tone.^[13] Clinically, its use has been associated with significant improvement in symptoms such as leg pain, swelling, itching, burning sensation, and edema in patients with CVI. Overall, *Aesculus hippocastanum* is considered an effective herbal remedy for the symptomatic management of venous disorders.

***Allium sativum* (Garlic)**



Figure.no 5: *Allium sativum* (Garlic)

Family: Amaryllidaceae

Part used: Flower bulb

Taste/Smell: Pungent

Dosage: Not standardized; used in traditional preparations as per formulation guidelines.

Allium sativum (garlic) (**Fig 5**) is a widely studied medicinal plant used in the management of Chronic Venous Insufficiency due to its strong vascular protective and circulatory-enhancing properties. It has gained significant attention in recent research for its ability to improve venous function and alleviate symptoms associated with venous disorders. The therapeutic effects of garlic are mainly attributed to its organosulfur compounds, particularly allicin and S-allyl cysteine, which enhance nitric oxide bioavailability, promote vasodilation, inhibit platelet aggregation, and improve peripheral microcirculation.^[14] Experimental studies have shown that standardized garlic preparations can reduce blood viscosity and improve endothelial function, thereby supporting better venous tone and reduced venous pressure. Garlic also contains several bioactive constituents, including alliin, ajoene, diallyl polysulfides, saponins, glycosides, amino acids, vitamins, and minerals, which contribute to its antioxidant, antihypertensive, and vascular-protective effects. Additionally, its biochemical actions, along with synergistic effects when combined with other agents such as onion and olive oil, further support vascular health by enhancing nitric oxide production and improving blood flow. Overall, garlic plays a significant supportive role in improving microcirculation, reducing venous stasis, and managing symptoms of chronic venous disorders.^[15]

***Collinsonia canadensis* (Stone Root)**

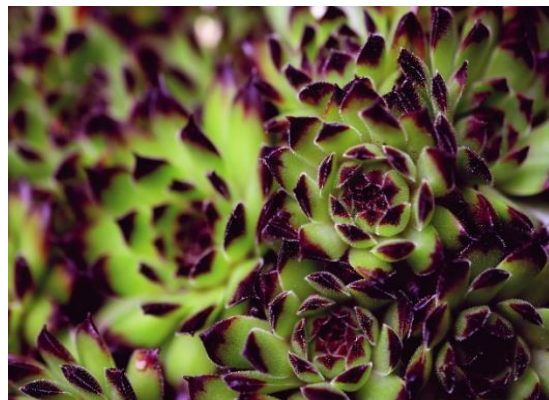


Figure.no 6: *Collinsonia canadensis* (Stone Root) Plant

Family: Lamiaceae or Mint family

Part used: Root

Taste/smell: Astringent

Dosage: 1-2 teaspoons of herb per cup of water (decocted) or 20-60 drops of 1:4 dry liquid extract, 1-4 times per day.

Collinsonia canadensis (stone root) (**Fig 6**) is a traditional medicinal plant used in the management of Varicose Veins due to its venotonic, anti-inflammatory, and astringent properties. It contains bioactive constituents such as flavonoids, saponins, and tannins, which contribute to strengthening venous walls, improving vascular tone, and reducing capillary permeability. These actions help in decreasing venous leakage and improving overall

microcirculation.

Pharmacologically, stone root is known to enhance vascular resistance and reduce pathologically increased capillary permeability. It exhibits anti-edematous and anti-inflammatory effects, helping to alleviate symptoms associated with varicose veins such as pain, heaviness, and swelling. Some reports also suggest the presence of aescin-like compounds that contribute to its anti-exudative activity by inhibiting lysosomal enzymes, thereby reducing vascular inflammation and fluid leakage.^[8] Overall, *Collinsonia canadensis* supports venous health by improving circulation and reducing venous congestion.

Capsicum frutescens (Cayenne)



Figure no 7: *Capsicum frutescens* (Cayenne Pepper) Plant/Fruit

Family: Solanaceae

Part used: Leaves and fruits

Taste/Smell: Spicy

Dosage: 1 heaping teaspoon per cup of water as infusion, or 10–40 drops of 1:1 fresh liquid extract, taken 3 times daily in a small amount of water.

Capsicum frutescens (cayenne pepper) (**Fig 7**) is traditionally used in the management of Varicose Veins due to its fibrinolytic, vasodilatory, and circulatory-enhancing properties. Its therapeutic activity is mainly attributed to capsaicin, which helps relax blood vessels, improve blood flow, and reduce venous pressure. This action may contribute to the relief of symptoms associated with varicose veins. Capsicum species are also reported to reduce the deposition of fibrin and fat in tissues surrounding varicose veins, thereby preventing hardening and lumpy skin changes. In addition, they may lower the risk of thrombus formation in conditions such as thrombophlebitis. Cayenne pepper is rich in vitamin C and bioflavonoids, which further support vascular health by improving circulation and reducing pain. Traditional usage suggests that cayenne pepper may be consumed by mixing 1 teaspoon in warm water and taken daily for 1–2 months, although its clinical efficacy is primarily supported by traditional and anecdotal evidence.^[8] Overall, *Capsicum frutescens* may help enhance microcirculation and provide symptomatic relief in venous disorders.

Ginger (*zingiber officinale*)



Figure.no 8: *Zingiber officinale* (Ginger)

Family: Zingiberaceae

Part used: Rhizome (underground stem)

Taste/Smell: Pungent, aromatic

Dosage: 1-2 g of dried rhizome powder or 1 cup of ginger infusion, taken 2–3 times daily.

Zingiber officinale (ginger) (**Fig 8**) exhibits significant therapeutic potential in the management of Varicose Veins due to its anti-inflammatory, antioxidant, and fibrinolytic properties. It is reported to help reduce fibrin deposition in tissues surrounding varicose veins, thereby preventing tissue hardening and lumpy skin changes. Ginger also reduces the risk of thrombus formation in conditions such as thrombophlebitis by improving blood fluidity and circulation. Pharmacologically, ginger contains bioactive compounds such as gingerols and shogaols, which contribute to its vascular protective effects.^[32] Gingerols stimulate nitric oxide (NO) production, leading to vasodilation, while shogaols help relax vascular smooth muscle. These actions collectively improve venous tone, enhance blood flow, and reduce venous pressure and swelling. In addition, flavonoids present in ginger support venous contraction and microcirculation, further contributing to improved vascular function. Experimental studies suggest that ginger also protects vascular smooth muscle cells from phenotypic transition and venous remodelling, indicating a role in preventing chronic vascular injury. Its strong antioxidant and anti-inflammatory properties further support its beneficial effects in vascular disorders.^[17,20] Overall, ginger may help relieve pain, improve circulation, and reduce symptoms associated with varicose veins.

Ginkgo biloba (Ginkgo)



Figure no 9: *Ginkgo biloba* (Ginkgo) Leaves

Family: Ginkgoaceae

Part used: Leaves

Taste/Smell: Slightly bitter and astringent

Dosage: 120–240 mg of standardized *Ginkgo biloba* leaf extract daily, divided into 2–3 doses (or as directed in formulations)

Ginkgo biloba (Ginkgo) (**Fig 9**) is a widely used medicinal plant with a long history of traditional use, and it is currently among the most commonly consumed herbal supplements worldwide. It has been investigated for its potential benefits in vascular disorders, including Chronic Venous Insufficiency (CVI) and peripheral arterial conditions. Clinical studies suggest that oral administration of *Ginkgo biloba* extract may provide modest improvement in symptoms such as claudication, characterized by leg pain during exercise or at rest due to reduced blood flow. Standardized ginkgo extracts, often used in combination formulations such as venotropic preparations containing troxerutin and heptaminol, have demonstrated protective effects on endothelial cells under hypoxic conditions in experimental models.^[18] In CVI, ginkgo-based formulations (e.g., Ginkgoselect, Phytosome) have shown beneficial effects in reducing oedema, although improvements in symptoms such as leg heaviness have been inconsistent. Multi-ingredient products like Ginkor Fort have also been used for the management of lower limb venous insufficiency.^[19] However, evidence regarding its effectiveness in peripheral arterial disease remains limited and inconclusive, highlighting the need for further well-designed clinical studies.



Agrimonia eupatoria (Agrimony)

Figure no 10: *Agrimonia eupatoria* (Agrimony) Plant

Family: Rosaceae or Rose family

Part used: Aerial parts

Taste/smell: Slightly bitter, astringent

Dosage: 1 heaping teaspoon per cup of water as infusion, or 10–40 drops of 1:1 fresh liquid extract, taken 3 times daily in a small amount of water.

Agrimonia eupatoria (Agrimony) (**Fig 10**) is a medicinal herb widely distributed across the Northern Hemisphere, traditionally used in herbal medicine for inflammatory conditions, poor circulation, and tissue damage, which are commonly associated with vascular disorders such as Varicose Veins. The plant is rich in bioactive phytoconstituents, particularly polyphenols and flavonoids including quercetin, kaempferol, and isoquercitrin, which exhibit strong antioxidant, anti-inflammatory, and Vaso protective effects.^[21] Experimental studies have demonstrated that compounds from agrimony can induce vasorelaxation in human arteries through nitric oxide-mediated pathways, suggesting an improvement in vascular tone and blood flow. Additionally, its astringent properties help tighten and tone venous walls, thereby reducing swelling and inflammation associated with varicose veins. Agrimony also supports wound healing and vascular integrity, contributing to reduced venous leakage and tissue damage. Traditionally, it has been used in the form of infusions, poultices, and ointments for managing symptoms such as pain, oedema, and inflammation in venous disorders.^[22] Overall, *Agrimonia eupatoria* shows potential as a supportive herbal agent in the management of varicose vein-related symptoms.



Myrica esculenta (Bayberry)

Figure no 11: Agrimonia eupatoria (Agrimony) Plant

Family: Myricaceae (Wax Myrtle family)

Part used: Bark and fruit

Taste/Smell: Astringent

Dosage: 1 teaspoon per cup of water as decoction, or 1-30 drops of 1:5 dry liquid extract, taken 1-3 times daily in a small amount of water.

Myrica esculenta (bayberry) (**Fig 11**) exhibits significant anti-inflammatory and antioxidant activities due to its rich phytochemical profile, which includes flavonoids, phenolics, and tannins. These bioactive constituents contribute to its therapeutic potential in vascular disorders such as Varicose Veins. The anti-inflammatory effects are mediated

through inhibition of pro-inflammatory cytokines, including TNF- α , IL-1 β , and IL-6, as well as suppression of key signalling pathways such as NF- κ B. Additionally, it reduces the activity of COX and LOX enzymes, thereby decreasing inflammatory responses.^[26] Its antioxidant action involves scavenging free radicals and enhancing endogenous antioxidant defence systems, including superoxide dismutase, catalase, and glutathione. Furthermore, flavonoids and phenolic compounds present in *Myrica esculenta* help improve capillary resistance and venous tone, thereby supporting microcirculation and vascular integrity.^[29] Overall, bayberry may serve as a supportive herbal agent in the management of varicose veins due to its combined anti-inflammatory, antioxidant, and Vaso protective effects.

Cinnamomum cassia (Cinnamon)



Figure no 12: *Cinnamomum cassia* (Cinnamon)

Family: Lauraceae

Part used: Inner bark

Taste/Smell: Pungent, aromatic, sweet

Dosage: 1 teaspoon per cup of water as infusion (steeped for 25 minutes), or 10–60 drops of 1:4 dry liquid extract, or 1–5 drops of essential oil. Higher doses are used for hemostatic effects.

Cinnamomum cassia (**Fig 12**) exhibits significant anti-inflammatory and antioxidant activities due to its rich bioactive constituents, including cinnamic aldehyde, cinnamic alcohol, cinnamic acid, and coumarin. Experimental studies using LPS-stimulated macrophage and carrageenan-induced paw edema models have demonstrated strong anti-inflammatory potential, particularly of cinnamic aldehyde, indicating its usefulness in managing inflammatory disorders. These phytochemicals contribute to improved vascular function by reducing inflammation and enhancing blood circulation, which may be beneficial in Varicose Veins and venous insufficiency.^[28] In addition, *Cinnamomum* species contain compounds such as eugenol, cinnamaldehyde, camphor, flavonoids, and phenolics, which provide strong antioxidant activity and support vascular protection. Cinnamon is also reported to improve blood flow by promoting vasodilation, thereby widening blood vessels and enhancing circulation. This combined anti-inflammatory, antioxidant, and vasodilatory action supports its potential role in improving venous tone and reducing symptoms associated with varicose veins and other circulatory disorders.^[24,25]

Citrus Fruits



Figure no 13: Citrus Fruits (*Rutaceae*)

Family: Rutaceae

Part used: Fruit (citrus fruit)

Taste/Smell: Sour, aromatic (citrus odor)

Dosage: 1–2 fruits daily or as fresh juice (approximately 100–200 ml), or as per formulation/standardized extract instructions.

Citrus fruits (**Fig 13**) (Family: Rutaceae), including lemons, oranges, and sweet limes, are rich sources of vitamin C, flavonoids, dietary fibre, folic acid, and other essential nutrients. These bioactive compounds contribute significantly to vascular health and are beneficial in the management of Varicose Veins due to their strong antioxidant properties. They help prevent oxidative stress-induced vascular damage, maintain endothelial integrity, and regulate normal blood flow, thereby reducing the risk of venous narrowing and congestion.^[23] Among citrus-derived flavonoids, hesperidin extracted from orange peels, especially in combination with diosmin, has shown notable therapeutic potential. This combination exhibits anti-inflammatory, antioxidant, and venotonic effects, which help reduce symptoms such as swelling, bleeding, cramps, and venous ulcers associated with varicose veins.^[31] Overall, citrus fruits play a supportive role in improving microcirculation and maintaining vascular function.

Oils Used in the Management of Varicose Veins

Various plant-derived oils have been reported to play a supportive role in the management of varicose veins due to their rich content of antioxidants, essential fatty acids, and bioactive compounds. Pumpkin oil obtained from *Cucurbita* (family Cucurbitaceae) is rich in antioxidants and essential fatty acids, which help support vascular health and reduce inflammation. Sunflower oil derived from *Helianthus annuus* (family Asteraceae) contains vitamin E, which improves skin elasticity and enhances microcirculation. Grape seed oil from *Vitis vinifera* (family Vitaceae) is rich in proanthocyanidins that strengthen capillary walls and reduce venous leakage. Similarly, rice bran oil obtained from *Oryza sativa* L. (family Poaceae) contains oryzanol and other antioxidants that help improve blood circulation and reduce oxidative stress. Collectively, these oils contribute to vascular protection, improved venous tone, and symptomatic relief in varicose veins.^[27, 30]

Table 1: Medicinal Plants Used in the Management of Varicose Veins: A Pharmacological Review

S. NO	PLANT NAME	FAMILY	PART USED	KEY PHYTOCONSTITUENTS	PHARMACOLOGICAL ACTIVITIES	THERAPEUTIC ROLE IN VARICOSE VEINS
1	<i>Ruscus aculeatus</i>	Liliaceae	Root (rhizome)	Ruscogenin, neoruscogenin	Venotonic, anti-inflammatory, anti-edematous	Reduces venous hypertension, improves microcirculation
2	<i>Centella asiatica</i>	Umbelliferae	Whole plant	Asiaticoside, madecassoside	Wound healing, collagen synthesis, venotonic	Strengthens venous wall, reduces edema
3	<i>Aesculus hippocastanum</i>	Hippocastanaceae	Seeds, bark	Aescin	Anti-inflammatory, anti-edematous, venotonic	Reduces capillary leakage, improves venous tone
4	<i>Allium sativum</i>	Amaryllidaceae	Bulb	Allicin, S-allyl cysteine	Antioxidant, vasodilator, anti-platelet	Improves blood flow and reduces venous stasis
5	<i>Collinsonia canadensis</i>	Lamiaceae	Root	Flavonoids, tannins	Astringent, venotonic, anti-edematous	Strengthens veins, reduces swelling
6	<i>Capsicum frutescens</i>	Solanaceae	Fruit, leaves	Capsaicin	Fibrinolytic, vasodilator	Improves circulation, reduces fibrin deposition
7	<i>Zingiber officinale</i>	Zingiberaceae	Rhizome	Gingerol, shogaol	Anti-inflammatory, antioxidant, fibrinolytic	Reduces inflammation and improves blood flow
8	<i>Ginkgo biloba</i>	Ginkgoaceae	Leaves	Flavonoids, terpenoids	Antioxidant, vasoprotective	Improves microcirculation, reduces edema
9	<i>Agrimonia eupatoria</i>	Rosaceae	Aerial parts	Quercetin, kaempferol	Vasorelaxant, antioxidant, anti-inflammatory	Improves venous tone and circulation
10	<i>Myrica esculenta</i>	Myricaceae	Bark, fruit	Tannins, flavonoids	Anti-inflammatory, antioxidant	Reduces inflammation, strengthens capillaries
11	<i>Cinnamomum cassia</i>	Lauraceae	Inner bark	Cinnamaldehyde, coumarin	Anti-inflammatory, vasodilatory, antioxidant	Enhances blood flow, reduces venous pressure
12	Citrus fruits	Rutaceae	Fruit	Vitamin C, hesperidin	Antioxidant, venotonic, anti-inflammatory	Improves vascular integrity and circulation

CONCLUSION

Varicose veins and Chronic Venous Insufficiency (CVI) represent a multifactorial vascular disorder characterized by venous hypertension, valvular incompetence, oxidative stress, inflammation, and structural remodelling of the venous wall. These pathological changes lead to progressive symptoms such as pain, oedema, heaviness, and, in severe cases, ulceration, significantly affecting quality of life. This review highlights the therapeutic potential of various medicinal plants and natural products in the management of varicose veins. Herbal agents such as *Ruscus aculeatus*, *Centella asiatica*, *Aesculus hippocastanum*, *Allium sativum*, *Zingiber officinale*, *Ginkgo biloba*, citrus fruits, and other medicinal plants exhibit significant venotonic, anti-inflammatory, antioxidant, vasodilatory, and anti-oedematous activities. These bioactive phytoconstituents improve venous tone, enhance microcirculation, reduce capillary permeability, and protect vascular endothelial function. Despite promising pharmacological evidence, most herbal interventions are still supported by limited clinical data and traditional usage. Therefore, well-designed randomized clinical trials, mechanistic studies, and standardization of herbal formulations are essential to validate their safety, efficacy, and therapeutic consistency. Future research focusing on the isolation and characterization of active phytoconstituents, along with detailed mechanistic studies, may facilitate the development of novel therapeutic agents for the effective management of varicose veins. Overall, herbal medicine offers a promising, cost-effective, and safer complementary approach for the management of varicose veins, particularly as an adjunct to conventional treatment strategies.

REFERENCE

1. Parihar S, Sarswati C, Sharma D. A brief review on herbs used in the treatment of varicose veins. *J Drug Deliv Ther*. 2022;12(1):158-62.
2. Büyükyıldırım T, Deniz FS. Natural treatment approaches for varicose veins: A brief review of the literature. *Trakya University Journal of Natural Sciences*. 2024;25(1):121-32.
3. Callam MJ. Epidemiology of varicose veins. *Journal of British Surgery*. 1994;81(2):167-73.
4. Evans CJ, Fowkes FG, Ruckley CV, Lee AJ. Prevalence of varicose veins and chronic venous insufficiency in men and women in the general population: Edinburgh Vein Study. *Journal of Epidemiology & Community Health*. 1999;53(3):149-53.
5. Golledge J, Quigley FG. Pathogenesis of varicose veins. *European journal of vascular and endovascular surgery*. 2003;25(4):319-24.
6. Fowkes FG, Lee AJ, Evans CJ, Allan PL, Bradbury AW, Ruckley CV. Lifestyle risk factors for lower limb venous reflux in the general population: Edinburgh Vein Study. *International journal of epidemiology*. 2001;30(4):846-52.
7. Saberianpour S, Modaghegh MH, Rahimi H, Kamyar MM. Role of mechanosignaling on pathology of varicose vein. *Biophysical Reviews*. 2021;13(1):139-45.
8. Palanisamy JK, Ponnu S, Mani S, Balakrishnan S. A critical review on traditional herbal drugs: an emerging alternative drug for varicose veins. *World Journal of Pharmaceutical Research*. 2018;7(5):316-8.
9. Büyükyıldırım T, Deniz FS. Natural treatment approaches for varicose veins: A brief review of the literature. *Trakya University Journal of Natural Sciences*. 2024;25(1):121-32.

10. Chong NJ, Aziz Z. A systematic review of the efficacy of *Centella asiatica* for improvement of the signs and symptoms of chronic venous insufficiency. *Evidence-Based Complementary and Alternative Medicine*. 2013;1:627182.
11. Brinkhaus B, Lindner M, Schuppan D, Hahn EG. Chemical, pharmacological and clinical profile of the East Asian medical plant *Centella asiatica*. *Phytomedicine*. 2000;7(5):427-48.
12. Incandela L, Cesarone MR, Cacchio M, De Sanctis MT, Santavenere C, D'auro MG, Bucci M, Belcaro G. Total triterpenic fraction of *Centella asiatica* in chronic venous insufficiency and in high-perfusion microangiopathy. *Angiology*. 2001;2(2):S9-13.
13. Pittler MH, Ernst E. Horse-chestnut seed extract for chronic venous insufficiency: a criteria-based systematic review. *Archives of Dermatology*. 1998;134(11):1356-60.
14. Rehan Haider ZA. Natural Pharmacological Management of Varicose Veins Using Garlic, Onion, and Olive Oil. *J. Nutrition and Food Processing*. 2025;8(10): 1-3.
15. Dahikar G. A review on remedies used in treatment of varicose veins and varicocele. *GSC Biological and Pharmaceutical Sciences*. 2022; 18(02): 244- 252.
16. Yu X, Wu W, Hao J, Zhou Y, Yu D, Ding W, Zhang X, Liu G, Wang J. Ginger protects against vein graft remodeling by precisely modulating ferroptotic stress in vascular smooth muscle cell dedifferentiation. *Journal of Pharmaceutical Analysis*. 2025;15(2):101053.
17. Thakur R, Yadav K, Khadka KB. Study of antioxidant, antibacterial and anti-inflammatory activity of cinnamon (*Cinamomum tamala*), ginger (*Zingiber officinale*) and turmeric (*Curcuma longa*). *Am J Life Sci*. 2013;1(6):273-7.
18. D'alessandro A, Caroli A, Mandolesi D, Venosi S, Orsini A, Riva A, Morazzoni P, Balbo A, Mandolesi S. Use of *Ginkgo biloba* phytosome in chronic venous disease: a pilot study. *Acta Phlebol*. 2015;16:83-92.
19. Ulbricht C. Peripheral vascular disease: an integrative approach: a natural standard monograph. *Alternative and Complementary Therapies*. 2012;18(1):44-50.
20. Mori Y, Raval M, Bhetariya A, Tank C, Vekariya I, Ghul V, Bhalara D. A detailed review of plants used in treatment of varicose vein. *Wjpr*. 2025; 14(7): 1285-1295.
21. Santos TN, Costa G, Ferreira JP, Liberal J, Francisco V, Paranhos A, Cruz MT, Castelo-Branco M, Figueiredo IV, Batista MT. Antioxidant, Anti-Inflammatory, and Analgesic Activities of *Agrimonia eupatoria* L. Infusion. *Evidence-Based Complementary and Alternative Medicine*. 2017; 1:8309894.21
22. Malheiros J, Simões DM, Antunes PE, Figueirinha A, Cotrim MD, Fonseca DA. Vascular effects of polyphenols from *Agrimonia eupatoria* L. and role of isoquercitrin in its vasorelaxant potential in human arteries. *Pharmaceuticals*. 2022;15(5):638.
23. More A, Jain Dk. Varicose veins: a comprehensive review on pathophysiology, prevention and treatment. 2025; 14(7): 1285-1295.
24. Liao JC, Deng JS, Chiu CS, Hou WC, Huang SS, Shie PH, Huang GJ. Anti-inflammatory activities of *Cinnamomum cassia* constituents in vitro and in vivo. *Evidence-Based Complementary and Alternative Medicine*. 2012;1:429320.
25. Ashfaq MH, Siddique A, Shahid S. Antioxidant activity of Cinnamon *zeylanicum*:(A review). *Asian Journal of Pharmaceutical Research*. 2021;11(2):106-16.



26. Pachiappan S, Jothilingam T, pushkalai Saravanan P, Sivakumar A, Gopalakrishnan P, Jothilingam T. The role of mitochondrial dysfunction in neurological disorders-Unraveling the connection. 2025; 24(4): 1472- 1484.
27. Sood P, Shri R. A review on ethnomedicinal, phytochemical and pharmacological aspects of Myrica esculenta. Indian Journal of Pharmaceutical Sciences. 2018;80(1).
28. Abascal K, Yarnell E. Botanicals for chronic venous insufficiency. Alternative and complementary therapies. 2007;13(6):304-11.
29. Vanscheidt W, Jost V, Wolna P, Lückner PW, Müller A, Theurer C, Patz B, Grützner KI. Efficacy and safety of a Butcher's broom preparation (Ruscus aculeatus L. extract) compared to placebo in patients suffering from chronic venous insufficiency. Arzneimittelforschung. 2002;52(04):243-50.
30. Ionescu N, Neagu AM, Popescu M. Preparation and characterization of vegetable oils and plant extracts with effect in the treatment of varicose veins. UPB Scientific Bulletin, Series B. 2021;83(3):185-92.
31. Kamble KU, Nitave SA. A review on varicose veins and its treatments. wjpr. 2022; 11(5): 678-689.
32. Pachiappan S, Jayakumar H, Manokaran B, Senthilkumar G. Medicinal plants for various kidney diseases: a review of phytomedicine research. TMP Universal Journal of Advances in Pharmaceutical sciences. 2025; 1(3): 203-219