



# Development of Herbal Oil for Treatment of Varicose Veins

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## ABSTRACT

Using both traditional and modern botanical knowledge, the project attempts to create and evaluate an herbal oil combination for the treatment of varicose veins. Each of the ingredients in the herbal oil—mustard oil, castor oil, eucalyptus, ashwagandha, ginger, and camphor—was chosen for their unique medicinal qualities that may improve skin conditions and circulatory health. Castor oil's anti-inflammatory qualities help reduce pain and swelling, while mustard oil, which is the main carrier, stimulates the circulation. The calming and relaxing properties of eucalyptus and camphor may lessen the agony brought on by varicose veins. The anti-inflammatory and stress-relieving qualities of ashwagandha are included since they are essential for controlling the signs and development of varicose veins. Finally, the warming and circulatory properties of ginger improve circulation, enhancing blood flow and reducing stasis

The preparation of this herbal formulation involves a meticulous infusion method in which the therapeutic elements of all the botanicals are extracted and preserved by gently heating them in the oil mixture. The finished product is meant to be applied topically and offers a natural substitute for controlling and reducing varicose vein symptoms. Regular use of the herbal oil is expected to alleviate varicose vein symptoms like pain, inflammation, and irritation as well as improve overall vascular health, according to this study's assumption.

**Keywords:** Stimulate, Stress-relieving, Herbal Oil.

## 1. INTRODUCTION

The term "varicose veins" refers to twisted, tortuous, or longer veins. Size by itself does not necessarily imply abnormalities unless the enlargement is quite significant, as size can change according on external factors such as ambient temperature and, in women, hormone levels<sup>1</sup>. Furthermore, typical superficial veins may appear huge in a thin person whereas concealed varicose veins may be present in an obese person. Trunk, reticular, or telangiectasia is the three types of varicose veins<sup>1</sup>.

The cause of varicose veins is malfunctioning valves in the deep, superficial, and/or perforating veins. Due to this incapacity, blood reflux increases venous pressure, which causes the lower leg subcutaneous veins to dilate, lengthen, or twist. Spider veins, star bursts, thread veins, and matted veins are other names for telangiectasia<sup>2</sup>.

### 1.1 Types of varicose veins

There are three different forms of varicose veins: reticular varicose veins, telangiectasia varicose veins, and stump varicose veins. The terms thread veins; matted veins, star bursts, and spider veins are all used to characterize telangiectasia. A minor proportion of varicose veins are brought on by secondary conditions such as arteriovenous fistulae, pelvic tumors, and deep vein clotting and blockage<sup>2-3</sup>.

### 1.2 Causes

Blockages that prevent blood from flowing via veins. Tumors and thrombosis are two instances of these barriers.

Nervous problems and stress. They have an impact on vein health. The blood vessel walls include nerve endings that keep them taut (toned). The veins enlarge and lose their tone when the pressure rises, affecting them with alcohol and other pollutants<sup>3</sup>.

Tension in sports. Those who enjoy lifting heavy objects, such barbells, are included in the risk group. It is not permitted to lift weights or engage in strenuous physical activity that strains the legs if there is a risk of varicose veins<sup>4</sup>.

Unsuitable footwear and clothes. Varicose veins can be brought on by wearing clothing that is too tight, like tight slacks. High-heeled shoes that are thin are also dangerous. Wide heels should be preferred when selecting shoes since they reduce the strain on the feet. Stitches are very high and narrow, which puts a lot of strain on the legs and veins when walking and balancing in them<sup>5</sup>.

### 1.3 Anatomy

A network of superficial veins linked to the deep veins by tiny perforator veins carries out the venous drainage of the lower limbs. Varicose veins can be caused by disease in any of these venous systems, but the more systems that are impacted; the more severe the symptoms become. Six Weakness in the vein wall occurs through a number of pathophysiological causes and eventually leads to varicosity<sup>7</sup>. Although branch vessels can also acquire varicosities, the larger and lesser saphenous veins are the usual sites. Widespread varicose veins may arise from blockage of the inferior vena cava or pelvic veins<sup>6</sup>.

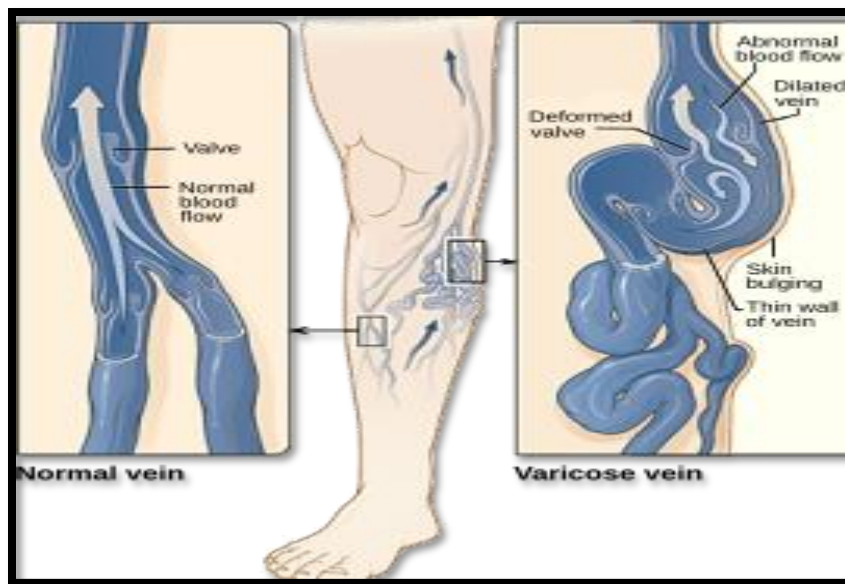


Fig1: Normal vs varicose vein

### 1.4 Pathophysiology

Varicose veins are primarily caused by venous hypertension, venous valvular incompetence, and structural modifications in the vein wall, inflammation, and changes in shear stress. Reflux resulting from venous valve incompetence, venous outflow obstruction, or calf-muscle pump failure is the cause of venous hypertension<sup>8</sup>. Venous hypertension develops below the region of venous valvular incompetence as a result of venous reflux, which can affect either or both the superficial and deep venous systems. High pressure is created in the deep veins during contraction of the calf muscle may be immediately transferred to the superficial system in patients with perforator vein incompetence. Deformation, tearing, thinning, and adhesion of the valve leaflets can all lead to valve incompetence<sup>9</sup>.

### 1.5 Etiology

Varicose veins appear to have venous illness as the primary cause of valvular reflux. Although the precise etiology is unknown, it involves compromised arterial walls, defective valves, elevated intravenous pressure, and a hereditary susceptibility<sup>10</sup>. The loss of vein wall flexibility, which results in the valve leaflets' inability to fit together, is most often thought to be the cause of valvular dysfunction. When a valve fails or becomes ineffective, blood flows in the opposite direction—from superficial to deep and from distal to proximal. The bigger veins may get longer and more twisted as the venous system that is afflicted is under more pressure<sup>11</sup>.

## 2.MATERIAL AND METHOD

When creating an herbal oil to treat varicose veins, it's important to choose components with anti-inflammatory, venotonic (vein tone-promoting), and circulatory qualities.

Following herbs are use in this formulation: -

- Mustered oil

- Castor oil
- Eucalyptus
- Ashwagandha
- Ginger
- Camphor

**Table no.1** Pharmacognostical Profile of Active Ingredients

s.no.	Name	Botanical profile	Active constituent	Therapeutic properties	Reference no.
1	Mustered oil	The seeds of the mustard plant, which belongs to the Brassicaceae family, are used to make mustard oil.	The main ingredient, allyl isothiocyanate, is what gives the oil its strong scent and irritating qualities. Erucic acid and other fatty acids are also present.	Antimicrobial, anti-inflammatory, circulatory stimulant, and analgesic properties are among its therapeutic qualities. For its warming effect on the skin and muscles, it is frequently applied topically.	4-5
2	Castor oil	Derived from castor bean plant seeds.	Approximately 90% of the fatty acid content in castor oil is made up of ricinoleic acid.	When consumed, it has stimulating and laxative effects. Its hydrating and anti-inflammatory qualities are applied topically. It's also believed to improve other chemicals' skin-mediated absorption.	6
3	Eucalyptus oil	Originated from eucalyptus tree leaves.	One of the main ingredients, 1,8-cineole (eucalyptol), makes up 70–90% of the oil's composition.	Traditionally used for respiratory ailments, this herb also functions as an expectorant and decongestant. Its qualities include analgesic, antiviral, antibacterial, and anti-inflammatory.	7-8
4	ashwagandha	A prominent herb in Ayurvedic medicine from	Contains a variety of phytochemicals, including withanolides, alkaloids, choline,	Its adaptogenic qualities are well-known for assisting the body in managing stress. Its immunomodulatory,	8

		the nightshade family.	fatty acids, and amino acids.	antioxidant, and anti-inflammatory properties are also reasons for use.	
5	Ginger	A rhizome that is widely used as both a spice and a medicine.	The main bioactive ingredient, gingerol, is in charge of many of the plant's therapeutic effects.	effects on gastrointestinal motility, anti-inflammatory, and antiemetic (prevents nausea and vomiting). It acts as an analgesic and warmant on the body.	9
6	Camphor	Derived from the wood of the camphor tree.	The primary active element is camphor, a terpenoid with a powerful, fragrant smell.	: Camphor is applied topically to provide numbing and cooling effects. It also functions as a counterirritant to lessen swelling and pain. It also possesses antibacterial and antifungal qualities.	6

## 2.1 Procedure

Firstly, prepare an herb, ginger and ashwagandha are use in powder form.



Mix castor oil (30ml) and mustard oils (50ml) in a double boiler. we need to use enough oil to completely submerge the herbs and make straining simple.



To the oil mixture, add the eucalyptus oil, ashwagandha powder, and grated ginger. Stir well.



Heat the oils and herbs over low heat for 2-3 hours. Avoid boiling the oil; a gentle heat will help the herbs infuse without breaking down too much.



Stir occasionally and ensure that the herbs do not burn.





In the last stages of the heating process, add camphor(5gms). Because of its intense qualities and rich aroma, camphor should be used sparingly and dissolved over low heat.



Allow to cool slightly. filter the oil to get rid of all the solid particles using filter paper or a fine sieve. Squeeze out as much oil as possible from the herbs.



To maintain its qualities, pour the squeezed oil into a dark glass bottle. Store the oil somewhere cold and dark place.



Fig:2. Extraction



Fig:3. Heat & Stirrer



Fig:4. Filtration

## 1. CHARACTERIZATION TEST

- pH
- Spreadability test
- Viscosity

### 3.1 pH –

Make sure the pH meter's electrode is completely submerged in the oil by dipping it in. Prior to recording the pH, wait for the measurement to stabilize. If you're using test strips, put the strip into the oil, take it out after the manufacturer's recommended amount of time, and then check the color shift to the chart.

To guarantee accuracy and consistency in your readings, repeat the measurement 2-3 times.



Fig:5. Digital pH Meter

### 3.2 Spreadability test-

Spoon a measured amount of the herbal oil into the bottom plate's middle. Usually, one gram or so of the oil is enough. The top plate should be lowered until it just brushes the oil's surface. Make sure the oil sample is situated exactly above it. Put the upper plate under a preset amount of stress. This could be accomplished by directly applying force using a force gauge or by fastening weights to the upper plate. A typical weight could range from 500 grams to one kilogram, depending on the oil's viscosity. As soon as the force is applied, start the timer. Take off the force and raise the top plate after a predetermined amount of time, such as 30 or 1 minute.



Fig:6. Spreadability testing of product

### 3.3 Viscosity-

Stir the oil sample well to guarantee homogeneity, particularly if it contains herbal extracts that could separate or settle. As directed by the viscometer's handbook, fill the sample container to the point where the spindle is completely submerged in oil without spilling over when it is inserted.



Fig:7. Brookfield Viscometer

## 4.RESULT

The study's goal was to create and assess a herbal oil blend that uses natural substances like ginger, eucalyptus, ashwagandha, mustard oil, and castor oil to cure varicose veins. These ingredients were selected based on their unique medicinal qualities, which are thought to help with symptom relief and enhance circulatory health.

**4.1 Methodology:** To extract the therapeutic characteristics, a regulated infusion technique was used after the ingredients were carefully chosen and combined. To guarantee safety, effectiveness, and user satisfaction, a battery of tests, including spreadability, viscosity, and pH assessments, were performed on the finished product.

### 4.2 Evaluation of pH:

The herbal oil's pH was regularly found to be between 5.5 and 6.5, which is the safe range for topical application. The ideal pH range for preserving the integrity of the skin barrier without irritating the skin is between slightly acidic and neutral.

pH of the product is determined by using digital pH meter. pH of this product is 5.34.

### 4.3 Testing for Viscosity:

The oil had a moderate viscosity, which guarantees adequate spreadability while staying substantial enough to stay on the skin without dripping, according to a Brookfield viscometer reading. Because of this, it can be applied to the legs, which are prone to varicose veins.

Viscosity of the oil is determined by Brookfield Viscometer and result is 534.1 mPa at 30 RPM.

### 4.4 Spreadability Testing:

The results of the spreadability testing demonstrated that the oil spreads easily and uniformly with little force used, pointing to its ease of application. This is important since the oil may be administered softly without causing pain or discomfort for consumers who may have varicose veins.

This test is performed by using glass slide and result is 4.5cm.

## 5.CONCLUSION

In summary, the herbal oil that was created to treat varicose veins shows promise in terms of its physical and chemical stability as well as initial user comments. The mixture of substances worked well to improve the look of varicose veins and relieve associated symptoms. Because of the oil's user-friendly, safe, and effective formulation, it presents a good alternative to more intrusive varicose vein treatments.

To properly evaluate the oil's long-term effects and any adverse effects, more research with bigger sample numbers and longer duration is needed. Furthermore, research that draw comparisons with currently available treatments can shed additional light on the herbal oil's effectiveness and affordability. Sustained quality and efficacy in practical applications will be ensured by routine formulation monitoring and improvement.



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