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# Herbal therapy for hemorrhoids: An Overview of Medicinal Plants Affecting Hemorrhoids

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## Abstract

Hemorrhoids are among the most common rectal diseases, affecting millions worldwide and causing substantial medical and socio-economic burdens. The resulting pain is very severe and incurs exorbitant costs for the patient and the government. This study aimed to review the medicinal plants that affect hemorrhoids. Complete databases searched for in those articles were Google Scholar, SID, Scopus, PubMed, Science Direct, and WOS search engines. The search was done for articles that included the search terms 'medicinal plants' and 'hemorrhoids' in their title. This study focused on published articles and papers from 2016 to 2022. The results showed medicinal plants *Aloe vera*, *Trigonella foenum-graecum* L., *Nigella sativa* L., *Curcuma longa* L., *Cocos nucifera* L., *Solanum nigrum* L., *Alhagi persarum* Boiss & Buhse, *Plantago lanceolata* L., *Achillea santolina*, *Malva neglecta* Wallr., *Rubus fruticosus* L. have effects like anti-bleeding, analgesic, anti-inflammatory, and wound-healing, and with hemorrhoid-healing effect. Generally, the investigated traditional Iranian edible plants are rich in different types of chemical compounds and have special benefits in the prevention and treatment of diseases.

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## Introduction

Hemorrhoid is a type of anal protrusion that occurs due to inflammation of the veins around the anus or inside the rectal canal [1]. The word 'hemorrhoid' comes from the ancient Greek words 'haema' and 'rhoos' meaning the flow of blood [2].

Hemorrhoids are the most common cause of lower gastrointestinal bleeding. Hemorrhoids include internal and external hemorrhoids. Internal hemorrhoids are inside the rectum and cannot be seen and are usually not painful. If the external hemorrhoid is located in the anus, where many pain-sensing nerves pass, it is painful and tends to bleed [3, 4]. Symptoms of hemorrhoids include bleeding, bulging, pain, and itching [5].

Epidemiological studies show that approximately 10 million people in the United States are affected by hemorrhoids, corresponding to a prevalence of 4.4% [5]. In the United Kingdom, hemorrhoids were reported to affect 13%-36% of the general population [3]. In Indonesia, hemorrhoids were estimated to affect 12.5 million people in 2015 [6]. There are various factors responsible for hemorrhoids like constipation, aging, sedentary lifestyle, obesity, pregnancy, low fiber diet, chronic constipation, straining during bowel movement, and so forth [3, 4]. Although hemorrhoids are not fatal, the physical and mental discomfort associated with the symptoms can seriously affect the quality of life of an infected person [1].

Some traditional medicinal plants are used along with new chemical drugs to prevent various diseases; help treat some diseases and prevent their complications [7-10]. The World Health Organization (WHO) encourages the development of herbal medicines based on traditional knowledge [11].

Many people can get relief from symptoms with home treatments and lifestyle changes [12-14]. Medicinal plants have a defense system including superoxide dismutase, catalase, and glutathione peroxidase, and also in this system, non-enzymatic agents include vitamin E, carotenoids, polyphenols, saponins, alkaloids, mucilage fibers, and anthraquinone [15]. Polyphenols are types of antioxidants that are involved in the prevention of many diseases, including cancer. These compounds are very diverse and have different effects. Phenolic compounds include vitamins, pigments, and flavonoids, which have anti-mutation and therefore anti-cancer properties, as well as hypoglycemic activity [16-19].

Also, different parts of medicinal plants such as leaves, stems, leaf juice, root, fruit, and seed are being used for treating hemorrhoids [12].

A clinical study on *Myrtus communis* essential oil demonstrated significant improvement in bleeding, permanent pain, pain during defecation, anal irritation,

anal itching, and anal heaviness in patients with hemorrhoid types I and II [2]. In recent years, much research has been done to treat this disease. Topical treatments include lidocaine gel, lidocaine ointment, suppository, and anti-hemorrhoid ointment. Due to the insufficient satisfaction of patients with hemorrhoids from the drugs available on the market, the purpose of this study is to review the medicinal plants that affect hemorrhoids.

## Methods

### Literature search strategy and selection criteria

Databases searched included Google Scholar, SID, Scopus, PubMed, ScienceDirect, and Web of Science. The search was done for articles published that included the search term containing medicinal plants and hemorrhoids in their title. This study focused on published articles and papers from 2016 to 2022.

## Discussion

The medicinal plants of different parts of Iran, which are effective on hemorrhoids, along with their additional information, are marked in Table 1.

### *Nigella sativa* L.

The black seed plant with the scientific name *Nigella sativa* L from the Ranunculaceae family is a plant with pale white or blue flowers and milky white seeds that turn black in contact with the air. This plant has also been used in the treatment of various liver diseases and respiratory disorders. In the books, traditional black medicine is recommended for the treatment of hemorrhoids. The most important compounds in black seed are volatile essential oils, alkaloids, flavonoids, and saponins. Black seed contains 40-30% oil and 0.5-1.5% of various essential oils and sugars. Flavanol triglycerides are also found in this plant. The essential oil of the plant contains more than 85% of monoterpenoid compounds [24,25].

### *Trigonella foenum-graecum* L.

*Trigonella foenum-graecum* L belongs to the Fabaceae family and is known as one of the oldest and most important medicinal plants in the world [46]. Its white flowers have a pod that contains small and brown seeds of the plant. This plant is native to the Middle East and is widely cultivated in the Indian subcontinent. It is grown in most parts of Iran, including Azerbaijan, Isfahan, Fars, Khorasan, Semnan, Damghan, and also in the central regions, and is also grown and consumed as an edible vegetable [47]. Research has clearly shown the therapeutic value of this plant and its medicinal capabilities [48]. Fenugreek seeds contain saponins, alkaloids, and mucilage fibers that have the most healing properties of fenugreek [49]. Experiments show

that this important medicinal plant has antibacterial effects, strengthens the immune system, and relieves tonsillitis, sore throat, intestines, and hemorrhoids [23].

Binomial Name	Family	Different parts	Uses	Ref
<i>Aloe vera</i>	Liliaceae	Leaf	Anthelmintic, hemorrhoid remedy, and uterine stimulant (menstrual regulator).	[20,21]
<i>Trigonella foenum-graecum</i> L.	Fabaceae	Extract	Elimination of tonsillitis, sore throat, stomach and intestines, hemorrhoids	[22, 23]
<i>Nigella sativa</i> L.	Ranunculaceae	Seed	Its seeds have a regulating, anti-worm, hemorrhoids, laxative, and milk-enhancing effect.	[24,25]
<i>Curcuma longa</i> L.	Zingiberaceae	Rhizome	Anti-inflammation, vaso-relaxant analgesic, anti-ulcer, anti-bacterial	[26-29]
<i>Cocos nucifera</i> L.	Arecaceae	Fruit	Anti-constipation, antioxidant, anti-inflammatory and antibacterial properties, appetite suppressant, and anti-depressant	[30, 31]
<i>Solanum nigrum</i> L.	Solanaceae	Flowers, green fruits, black fruits, stems, and roots	Hemorrhoid	[32-35]
<i>Alhagi persarum</i> Boiss & Buhse.	Fabaceae	Stems, leaves, flowers	Wound healing, kidney and bladder stones, hemorrhoids, jaundice	[35-37]
<i>Plantago lanceolata</i> L.	Plantaginaceae	Leaves, seeds	Elimination of colds and old coughs, wound healing, skin disorders, hemorrhoids	[35,38]
<i>Achillea santolina</i>	Asteraceae	Extract	Hemorrhoid	[39]
<i>Malva neglecta</i> Wallr	Malvaceae	Leaves, seeds	Hemorrhoid	[39]
<i>Rubus fruticosus</i> L.	Rosaceae	Aerial part	Hemorrhoid	[40]
<i>Ruscus</i> L.	Asparagaceae	Rhizome	Hemorrhoid	[41]
<i>Verbascum</i>	Scrophulariaceae	leaves, flowers, Extract	Hemorrhoid	[42-45]
<i>Phyllanthus Emblica</i> L.	Euphorbiaceae	Fruit	Hemorrhoid	[44, 45]

**Table 1:** Medicinal plants of different parts of Iran

### *Curcuma longa* L.

*Curcuma longa* L is from the ginger family, a herbaceous and perennial plant with a height of one to one and a half meters and has a swollen rhizome from which several aerial stems emerge. The food and

medicinal part of this plant is its dried rhizomes. In addition to curcumin, there are several chemical compounds such as volatile oil, ginger,  $\alpha$ - and  $\beta$ -turmerone, and other compounds such as arabinose, fructose, nectarine, and nectarine [29, 50]. Turmeric is traditionally used as a spice and medicine in many countries. Rhizome powder of this plant in medicinal products for the treatment of various diseases including rheumatism, body aches, intestinal parasites, diarrhea, liver disorders, gastric disease, urinary tract infections, indigestion, inflammation, white spots in the body, white spots in the body, Used for intestinal and hemorrhoid skin diseases [26-29].

### Coconut

Coconut is a member of the Arecaceae family and is the only species classified in the genus Coconut. According to the study by Singla et al. Coconut and its products have anti-constipation, antioxidant, anti-inflammatory, and antibacterial properties, appetite suppressants, and anti-depressant [29, 51]. It also has the property of improving the function of colon cells and inhibiting the growth of damaged and cancer cells in it. Studies have shown that this oil is a rich source of antioxidant compounds called anthraquinone, which has a laxative effect. In traditional medicine, the possible therapeutic properties of this oil in the treatment of constipation have been discussed [30, 31].

### *Aloe vera*

*Aloe vera* belongs to the Liliaceae family and contains amino acids, vitamins, minerals, and valuable substances such as Aloein, Emodin, anthraquinone, and emodin with anti-viral, anti-fungal properties, anti-bacterial, anti-rheumatic, anti-cancer, anti-aging, anti-inflammatory. In Ayurvedic medicine, the traditional medicine of India, aloe is used internally as a laxative, anthelmintic, hemorrhoid remedy, and uterine stimulant (menstrual regulator). Due to its different medicinal properties, *aloe vera* is involved in the production of gels and ointments in pharmacy [20, 21]. The black nightshade medicinal plant belongs to the genus Solanaceae, one of the native herbaceous and medicinal plants of Iran, which grows like a weed. Lipids extracted from the leaves of this plant have analgesic, antipyretic and anti-inflammatory properties. Methanolic extract extracted from this plant reduces mucosal damage and gastric ulcers. Also, the anti-cancer effect and hemorrhoids of this plant have been proven [32-35].

### *Alhagi persarum* Boiss & Buhse

*Alhagi persarum* Boiss & Buhse belongs to the subfamily Papilionoideae, an invasive perennial herbaceous plant, 50-80 cm tall, hairless, green, belongs to the butterfly family, and has many thorns

[13]. This plant grows in dry, rocky, and saline soils [26]. *Alhagi persarum* is traditionally used as a medicinal plant, prepared in the form of extracts, oils, and decoctions. Its resin, known as 'harsher,' contains bioactive compounds with reported antipyretic properties. The cooked leaves are used to heal wounds. It is useful for headaches and heart palpitations. It opens stomach obstruction and is appetizing. Harsh sweat is good for the liver, kidneys, and spleen and cleanses the kidneys and bladder. The oil of the leaves of the plant is useful for rheumatic pains and the oil of its flowers is used for hemorrhoids and is a laxative. It is useful in preventing smallpox, its young and green leaves and branches are cooling [35-37].

#### ***Plantago lanceolata* L.**

*Plantago lanceolata* L. is a perennial plant of the genus Plantaginaceae that grows in temperate regions around the world. The use of the herb has long been used in traditional medicine and is used to treat skin wounds and skin disorders, infectious diseases, gastrointestinal disorders, respiratory and circulatory disorders, and hemorrhoids [35, 38]. Yarrow is a genus of chicory. This genus with about 1000 genera and 20,000 species is distributed all over the world and grows abundantly in temperate and cold regions. Alcoholic extract of its flowering branches lowers fat and blood pressure [52]. Its aqueous-alcoholic extract has an inhibitory effect on gastric acid secretion by inhibiting the gastric vagus nerve [53].

Aqueous extract of this plant has stimulating effects on humoral immunity and is cellular [54]. The flowering branches of this plant are rich in flavonoids and sesquiterpene lactone and its pollens are also highly allergenic [55]. This plant due to its tannins and bitter and aromatic substances strengthens the nerves and the heart; It has been used in various therapeutic cases such as general fatigue, weakness, and inflammation of the heart muscle, as well as in neurological diseases such as weakness of the nerves and epilepsy [52]. The genus *Ruscus* belongs to the genus Asparagus, which has six species that are distributed all over the world and contains a steroid, saponin, and glycoside derivatives. *R. aculeatus* is the only species of this genus that grows in Iran and is found in abundance in northern forests and wet valleys. In traditional medicine, the extract of this plant is used as a tonic for venous arteries and the treatment of hemorrhoids. The therapeutic effect of this plant is related to the presence of steroid saponins, which contain up to 6% of the dry weight of the plant. The major saponins in this plant are ruscin, ruscogenin, and neoruscogenin aglycones [41].

#### ***Verbascum cheiranthifolium***

*Verbascum cheiranthifolium* is a biennial herbaceous plant that has yellow flowers and leaves with cotton hairs and a thick stem about 2 meters high that grows in barren lands, forests, and fields. In mountainous areas, it rises to 180 cm. The main constituents of *Verbascum* species extract are flavonoids, saponins, iridoids, phenylethanoid glycosides, monoterpene glucosides, steroids, Spearman alkaloids, phenolic acids, fatty acids, tannins, carotenes, etc. The most important therapeutic properties of this plant are relieving heartburn, colds, bronchitis, fever, anti-hemorrhoids, and migraines. The use of this plant in traditional medicine is various and can be mentioned as an emollient, expectorant, diaphoretic, and a gargle in the treatment of asthma [42, 43]. Hemorrhoids are a painful condition that causes inflammation and enlargement of the veins around the anus. There are natural remedies for hemorrhoids. The high tendency of people to natural and harmless and at the same time cost-effective treatments, as well as its cultural compatibility, has led to the widespread use of medicinal plants in traditional Iranian medicine. [56]. The plant parts which have been utilized for hemorrhoid treatment include roots, fruits, seeds, aerial parts, etc. Also, herbal medicines are made from different organs of one or more plants and the most common form of medicine is boiled and brewed. These plants can improve hemorrhoid complications such as bleeding, anti-constipation, antioxidant, anti-inflammatory, and antibacterial properties, appetite suppressant, and anti-depressant pain and inflammation. In addition, various classes of phytochemicals, particularly flavonoids and terpenoids, can be responsible for the hemorrhoid-healing effects of these plants.

Recent investigations showed that there are many medicinal plants with hemorrhoid-healing effects cited medicinal *Aloe vera*, *Trigonella foenum-graecum* L., *Nigella sativa* L., *Curcuma longa* L., *Cocos nucifera* L., *Solanum nigrum* L., *Alhagi persarum* Boiss & Buhse, *Plantago lanceolata* L., *Achillea santolina*, *Malva neglecta* Wallr, *Rubus fruticosus* L have useful effects in hemorrhoid treatment through all or at least two related biological effects like anti-bleeding, analgesic, anti-inflammatory, venotonic properties, and wound-healing, and they can be considered to be an important resource for producing novel drugs for hemorrhoid treatment. Rahimi et al. have appraised plants used to treat hemorrhoids in different countries [57]. They introduced some important species with related pharmacological properties along with their active constituents.

*Quercus brantii* has a high percentage of tannins and has various therapeutic effects. In recent years, this plant has been used to treat inflammation and



hemorrhoids [58]. The results of research on different fractions of black seed show that the anti-inflammatory effect of aqueous extract of black seed is approximately equivalent to aspirin in laboratory animals [59].

And the anti-inflammatory effect of its hydroalcoholic extract is approximately equivalent to that of indomethacin [60]. Fenugreek seeds have a high percentage of mucilage and have anti-inflammatory and emollient effects [61]. The anti-inflammatory activity of *Achillea mille folium* crude extract has also been confirmed experimentally via in vitro protease inhibition assays. Flavonoid-enriched fraction inhibited the human neutrophil elastase ( $IC_{50} = 72 \mu\text{g/mL}$ ), which could represent it as a potent anti-inflammatory medicament [62]. Finally, more detailed studies on the chemical components and biological activities of plants used in hemorrhoid treatment can be made. Today, herbal therapy and the use of herbal preparations [63-74] have a special application in the treatment of many diseases [75-79]. Because herbal medicines are rich in antioxidants and medicinal bioactive substances [80-85].

## Conclusion

Herbal remedies for hemorrhoids are beneficial because herbs may contain bioactive compounds that are effective in treating hemorrhoids. This plant also has anti-parasitic, anti-inflammatory, antioxidant, anti-cough, anti-tumor effects on hemorrhoids. Therefore, due to the growth and the relatively widespread use of these plants in different regions of Iran, it is suggested that they be used as medicinal plants with detailed studies.

## Competing Interest

The authors declare that there is no conflict of interest.

## Author Contributions

All authors contributed equally to the manuscript.

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