



Essential Oils: Herbal Remedy for Treatment of Vaginal Infections

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Abstract

Vaginal infections caused due to *Candida* species are very common in recent years because of current stressful lifestyle of women. Though these infections are not life threatening but can affect daily routine and standard of living of an individual female, hence care must be taken. Various vaginal infections can be treated using variety of synthetic dosage forms like oral tablets, capsules and topical tablets, suppositories, creams etc. that are available in market. The microorganisms develop resistance with prolong use of synthetic chemicals, so there is a need to reduce the use of synthetic antimicrobials. In this review article, we have focused on natural remedies for the treatment of vaginal infections which will ensure better results with lesser side effects. Over previous years a large number of essential oils isolated from various parts of the plant have been investigated for their antimicrobial properties against bacteria and fungi. The treatment of vaginal infections with essential oils has shown rapid recovery due to site specificity by exposing the individual's infected part. This article enlists various essential oils obtained from diverse natural sources, their source of procurement, chemical composition and their role in treatment of vaginal infections. The article also includes the directions for use whether in diluted form or in combination with other additives. The article justifies the use of essential oils for the treatment of vaginal infections like vulvovaginal candidiasis.

Keywords: Essential oil, vaginal infection, *Candida*, antimicrobial.

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Introduction

In the last few decades, the incidence of fungal infections has increased in females. *Candida*

species are commensal yeasts found on the skin, mucous membranes, gastrointestinal tract, blood and vagina. They are opportunistic pathogens

that can cause local and systemic infections. Among various *Candida* species, *C. albicans* is the most common organism associated with serious fungal infections such as vulvovaginal candidiasis. Along with this several bacterial species cause an inflammation of the vagina known as bacterial vaginitis. Vaginitis has been associated with several complications and is known to increase the risk of acquiring Sexually Transmitted Diseases (STDs) such as Gonorrhoea, Chlamydial infection, Trichomoniasis and Human Immunodeficiency Virus (HIV), as well as reproductive complications (Gallo MF *et al*, 2011). Nearly 5–10 million females seek gynecologic advice for vaginitis every year world-wide. Globally it is reported that three fourth (75%) of women would experience an episode of vulvovaginal candidiasis in their lifetimes, 50% of these would experience at least a second episode, and 5–10% of all women will experience recurrent vulvovaginal candidiasis (Bitew A *et al*, 2018). Vaginal candidiasis may be regarded as a minor condition wherein its physical effects are not seriously damaging, but many studies report that recurrent vaginal candidiasis can affect sexual functioning, emotional relationships and deterioration in quality of life. (Irving G *et al*, 1998). Therefore it is crucial to diagnose and identify the infection at the early stage and utilize appropriate treatment. Changing lifestyle of women is the main cause of vaginal infections, stressful conditions lead to release of certain hormones which suppress the

immune system and increase the susceptibility to vaginal infections (<https://beatcandida.com>). Other factors like sexual activities including multiple partners, frequency of intercourse, receptive oral sex and use of contraceptives *etc.*, feminine hygiene products like vaginal douches, as well as smoking, alcohol, drug consumption may contribute to excess risk of vaginal infections (Culhane JF *et al*, 2006). Along with above mentioned factors, use of skin-fit pants and leggings, use of restrictive and poorly ventilated clothing, use of nylon undergarments, use of tampons rather than sanitary napkins may lead to vaginal candidiasis. Using sanitary napkin for more than 5 hours during menstrual cycle may lead to vaginal infections. During pregnancy, the risk of vaginal infections increases.

Vaginal infections can be treated by various pharmaceutical products available in market such as antifungal creams (VAGISTAT-3, Himalaya V GelTM), tablets (AZO Yeast[®] Plus tablets, Mycoten[®] tablets) etc. There is an increasing demand to reduce the use of chemicals as antimicrobial agents in the field of medicine to combat various infections due to increasingly aggressive endogenous microorganisms that are resistant to the use of synthetic antimicrobials. Medicinal plants contain chemical constituents that are present in their different parts as active ingredients which are used to prevent or treat physical and mental disorders as well as to maintain health (Moghaddam M *et al*, 2017).

Since plants existed on earth from the very beginning of human evolution, the use of plants in the daily lives of human is as old as human civilization on earth. Some knowledge behind the use of medicinal plants had passed down from ancestors to predecessors. Hence traditionally numerous medicinal plants were widely used for treatment of various diseases. The synthetics exhibited greater efficacy and were widely used, but later on they started developing resistance towards various microorganisms. Therefore because of safety and low toxicity of medicinal plants, there is an increasing interest towards exploring and use them in the pharmaceutical industries. One such active constituents attracting attention of researchers are essential oils.

The term “Essential Oil” was coined in the 16th century by the Swiss reformer of medicine, Paracelsus Von Hohenheim (Aparnathi KD *et al*, 2016). Essential oils were firstly used in the East and the Middle East, then in North Africa and Europe. Essential oils are multi-component chemicals that contain the mixture of polar and non-polar compounds. They are complex mixtures of odorous principles stored in special plant cells, glands, glandular hairs, oil ducts, or resin ducts. Oils are isolated by pressing and steam distillation from a whole plant or different parts of plants such as leaves, flowers, fruits, grass, root, wood, bark, gum, and blossom *etc*. Over past few years a large number of essential oils and their constituents have been investigated for their antimicrobial properties against bacteria

and fungi (Winska K *et al*, 2019). It is important to consider the type of essential oil while using, as well as the concentration and method of extraction. Due to extreme potency some essential oils can cause skin inflammation and allergic reactions, particularly in people with sensitive skin. Hence rather than using a crude oil it must be diluted with a base and used in suppository, vaginal oil, tampon and douches. Vaginal washes like V WashTM also contains tea tree oil.

Home based essential oil treatments for vaginal infections

1. Tampons are dipped into various mixture of essential oils and diluents, like 2-3 drops of tea tree oil with olive oil; a combination of cinnamon oil with 1 tablespoon of coconut oil or 5 drops of thyme oil with 1 tablespoon of jojoba oil *etc*. (<https://www.organicfacts.net>).
2. For douching of vagina, 5 drops of geranium oil with water. 10-15 drops of lavender oil is added into warm water and bath is taken with it. (<https://www.organicfacts.net>).
3. For application directly on infected area, 3-4 drops of lemongrass oil along with sweet almond oil. 4-5 drops of clove oil is taken on cotton ball and gently dabbed. Oregano oil is diluted with coconut oil or olive oil (<https://www.organicfacts.net>). The table mentioned below enlists essential oils used against various vaginal infections.

Table 1: Essential oils and their chemical constituents effective against vaginal infections

Sr. No.	Common Name	Biological name	Chemical Constituents	Effective against
1.	Tea Tree Oil	<i>Melaleuca alternifolia</i>	Terpinen-4-ol, α -terpineol, linolool, α -pinene, β -pinene	Bacterial vaginitis, vaginal candidiasis and Trichomoniasis (Baeryl N <i>et al</i> , 2017)
2.	Cinnamon Oil	<i>Cinnamomum verum</i> , <i>Cinnamomum zeylanium</i>	Cinnamanol, cinnamaldehyde	Bacterial vaginitis (https://www.organicfacts.net)
3.	Clove Oil	<i>Syzygium aromaticum</i>	Carvacol, eugenol	Fungal infection (https://www.organicfacts.net)
4.	Orange Oil	<i>Citrus sinensis</i>	Vitamin C, myrcene, citronellal	Yeast infection (https://www.organicfacts.net)
5.	Garlic	<i>Allium sativum</i>	Allicin, agonene, alliin	Bacterial vaginitis, Candidiasis (Baeryl N <i>et al</i> , 2017)
6.	Persian Shallot	<i>Allium hirtifolium</i>	Allicin, agone	Bacterial candidiasis, Trichomoniasis (Baeryl N <i>et al</i> , 2017)
7.	Goldenseal	<i>Hydrastis canadensis</i>	Hydrastine, berberine	Bacterial vaginitis, vaginal candidiasis and Trichomoniasis (Baeryl N <i>et al</i> , 2017)
8.	Shirazi Thyme	<i>Zataria multiflora</i>	Carvacrol, thymolcarvacrol, linalool	Candidiasis, Trichomoniasis (Baeryl N <i>et al</i> , 2017)
9.	Lavender Oil	<i>Lavendula augustifolia</i> , <i>Lavendula binaludensis</i>	Linolool, linalylacetate, γ -terpene	Vaginal candidiasis, Vulvovaginal candidiasis (Behmanesh F <i>et al</i> , 2015)
10.	Lemongrass Oil	<i>Cymbopogon citatus</i>	Neral, geranial	Candidiasis (Schwartz A <i>et al</i> , 2006)
11.	Thyme Oil	<i>Thymus vulgaris</i>	Thymol, linolool, terpinen-4-ol,	Vulvovaginal candidiasis, Bacterial Vaginitis (Schwartz A <i>et al</i> , 2006)
12.	Clary Sage Oil	<i>Salvia sclarea</i>	Linalyl acetate, linalool	Candidiasis (Schwartz A <i>et al</i> , 2006)
13.	Rosemary Oil	<i>Rosmarinus officinalis</i>	α -pinene, camphor, 1,8-cineole	Bacterial vaginitis, Vulvovaginal candidiasis (Schwartz A <i>et al</i> , 2006)
14.	Palmarosa	<i>Cymbopogon martinii</i>	Geraniol, geranyl acetate	Bacterial vaginitis, Vulvovaginal candidiasis (Schwartz A <i>et al</i> , 2006)
15.	Geranium Oil	<i>Pelargonium graveolens</i>	Citronellol, geraniol, linalool	Bacterial vaginitis, vulvovaginal candidiasis (Schwartz A <i>et al</i> , 2006)
16.	Neroli	<i>Citrus aurantium</i>	Linalool, terpinen-4-ol,	Bacterial vaginitis (Schwartz A <i>et al</i> , 2006)

17.	Manuka	<i>Leptospermum scoparium</i>	Leptospermone, calamenene, cadina-1,4-diene	Bacterial vaginitis (Schwiertz A <i>et al</i> , 2006)
18.	Cumin	<i>Cuminum cyminum</i>	Limonene, α -terpine, β -pinene	Candidiasis (Minooeianhaghgha MH <i>et al</i> , 2016)
19.	Fennel	<i>Foeniculum vulgare</i>	Limonene, anethole, fenethone	Candidiasis (Bassyouni RH <i>et al</i> , 2019)
20.	Oregano Oil	<i>Origanism vulgare</i>	Linolool, thymol, α -terpineol	Vulvovaginal candidiasis (Khosravi AR <i>et al</i> , 2011)
21.	Artemisia	<i>Artemisia siberi</i>	β -thujone, camphor, α -thujone, α -terpinen	Vaginal infections (Khosravi AR <i>et al</i> , 2011)
22.	Mentha	<i>Mentha suaveolens</i>	Carvone, limonene	Vulvovaginal candidiasis (Srivastava N <i>et al</i> , 2018)

Conclusion

Due to today's busy and stressful lifestyle where a woman has to manage both her professional and personal life, she tends to neglect herself. Poor eating habits, wearing tight fitting clothes and not changing sanitary napkins in time can increase the risk of vaginal infections. If not treated in time can lead to serious complications affecting their standard of living. Many studies suggest that various constituents of essential oils show activity against microorganisms causing vaginal infections. Essential oils in proper concentration with suitable additives are beneficial in treatment of vaginal infections. Hence they can be used as most effective herbal remedy to overcome various vaginal infections.

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