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# Importance of Herbal Remedies in the Treatment of HIV & TB Infection



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## ABSTRACT

TB frequently occurs early in the course of HIV infection, often months to years before other opportunistic infections such as *Pneumocystis carinii* pneumonia. TB may be the first indication that a person is HIV-infected, and often occurs in areas outside the lungs, particularly in the later stages of HIV disease. Herbal and conventional medicine are part of a healing spectrum, in which each has something positive but different to offer. Although conventional medicine's high-technology approaches are especially useful in treating acute disease and in emergency care, herbal medicine by supporting wellness is more suitable for dealing with the chronic ailments that are increasingly affecting modern society. Barberry or *Berberis vulgaris* is highly effective in relieving TB symptoms and is used to complement conventional treatment.

## INTRODUCTION

WHO estimates that 4.4 million people worldwide are coinfectd with TB and HIV. By the year 2000, TB will claim 1 million lives annually among the HIV-infected, WHO projects, making TB the leading cause of death in HIV-infected individuals.

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In the United States, people coinfectd with TB and HIV develop active TB at a rate of about 8 percent each year. By comparison, otherwise healthy individuals infected with *M. tuberculosis* have a 10 percent lifetime risk of developing active TB. People with HIV also are at greater risk of having a new infection progress directly to active disease.

MDR-TB in people coinfectd with HIV appears to have a more rapid and deadly disease course than seen in patients with MDR-TB who are otherwise healthy.

Diagnosing TB in HIV-infected people is often difficult. These patients frequently have conditions that produce symptoms similar to those of TB, and may not react to the standard tuberculin skin test because their immune systems are suppressed. Although investigators have hypothesized that a two-stage TB skin test might be more reliable than a single-stage test in HIV-infected individuals, a recently completed NIAID study found this not to be the case.

X-rays, sputum smears, and physical exams may also fail to provide an indication of TB infection in HIV-infected individuals. As a consequence, doctors must often decide to begin anti-TB therapy in HIV-infected people suspected of having active TB while waiting for the results of cultures of sputum or other specimens.

Tuberculosis, MTB or TB is a fatal infectious disease caused by various strains of mycobacteria, usually *Mycobacterium tuberculosis*. Tuberculosis typically attacks the lungs, but can also affect other parts of the body. It spreads through the air when people who have an active TB infection cough, sneeze or otherwise transmit respiratory fluids through the air. Most infections

do not have symptoms known as latent tuberculosis. The classic symptoms of active TB infection are a chronic cough with fever, night sweats and weight loss. Infection of other organs causes a wide range of symptoms. Diagnosis of active TB relies on radiology (commonly chest X-rays), as well as microscopic examination and microbiological culture of body fluids. Diagnosis of latent TB relies on the tuberculin skin test (TST) or blood tests. Prevention relies on screening programs and vaccination with the Bacillus Calmette-Guérin vaccine.

### **1. Pulmonary Tuberculosis**

If a tuberculosis infection does become active, it most commonly involves the lungs (in about 90% of cases). Symptoms may include chest pain and a prolonged cough producing sputum. About 25% of people may not have any symptoms (i.e. they remain "asymptomatic") occasionally, people may cough up blood in small amounts, and the infection may erode into the pulmonary artery resulting in massive bleeding. The upper lung lobes are more frequently affected by tuberculosis than the lower ones. It may be due either to better air flow or to poor lymph drainage within the upper lungs.

### **2. Extrapulmonary Tuberculosis**

In 15–20% of active cases, the infection spreads outside the lungs, causing other kinds of TB. These are collectively denoted as "extra pulmonary tuberculosis". Extra pulmonary TB occurs more commonly in immunosuppressed persons and young children. In those with HIV, this occurs in more than 50% of cases. Notable extrapulmonary infection sites include the central nervous system (in tuberculosis meningitis), the lymphatic system, the genitourinary system (in urogenital tuberculosis), and the bones and joints (in Pott disease of the spine), among others. When it spreads to the bones, it is also known as "osseous tuberculosis", a form of osteomyelitis (13).

## Herbal Drugs Used In the Treatment of Tuberculosis:

### 1. ADULSA



#### Synonyms:

*Justicia adhatoda*, commonly known in English as Malabar Nut, Adulsa, Adhatoda, Vasa, or Vasaka is a medicinal plant native to Asia.

#### Chemical composition:

The leaves of *Adhatoda vasica* contains phytochemicals such as alkaloids, tannins, saponins, phenolics and flavonoids. The most important is vasicine, a quinazoline alkaloid. The vasicine yield of the herbage has been measured as 0.541 to 1.1% by dry weight.

#### Use

Expectorant in Tuberculosis, vasicine also shows oxytocic property similar to oxytocin (9).

### 2. GARLIC



**Synonyms:** Allium

**Biological source:** This consists of bulbs of the plant known as *Allium sativum* Linn. Family-liliaceae

**Composition:** Garlic contains 29% carbohydrates, 56% proteins (albumin), and 0.06 to 0.1% volatile oil, volatile oil of drug is a chief constituent and contains allyl propyl disulfide, diallyl diasulfide, allin and allicin.

### Use

#### Antiseptic/Antibacterial properties

Garlic juice and essential garlic oil, water, and ethanol extracts inhibit the *in vitro* growth of *Aspergillus niger*, *Bacillus* species, *Candida* species, *Cryptococcus* species, *Mycobacterium tuberculosis*. Both gram-positive and gram-negative organisms are inhibited *in vitro* by garlic extracts.

#### Blood glucose effects

Garlic has been suggested to reduce blood glucose levels, increase serum insulin, and improve liver glycogen storage.

**Immunology:** Garlic contains the trace elements germanium and selenium, which have been thought to play a role in improving host immunity (2).

### 3. BARBERRY



**Synonym:** Berberis

**Biological Source:** Roots and Rizomes of *Berberis aristata*, and other *Berberis* species, Berberidaceae

**Main constituent:** Berberine

#### Use

Barberry or *Berberis vulgaris* is highly effective in relieving TB symptoms and is used to complement conventional treatment. The active ingredient in barberry is berberine which has bacterial properties and aids in killing the tuberculosis bacteria (14).

#### 4. LIQUORICE



**Synonyms:** Yasti, Mulethi, Glycyrrhiza

**Biological source:** Yasti consists of dried, unpeeled roots and stolons of *Glycyrrhiza glabra* Linn, family-Leguminosae. Yasti contains not less than 3.0% of glycyrrhinic acid.

#### **Chemical constituent:**

The chief constituent of liquorice is a triterpenoid saponin known as glycyrrhizin which is a potassium and calcium salt of glycyrrhizinic acid. The other constituents are glycyrrhizin, glycyrrhizic acid, saponins, coumarins, sterols, choline, triterpenoids, lignins, amino acids, folic acid, pantothenic acid, phosphorous, protein, sugar, vitamins B1, B2, B3, B6 and E.

**Medicinal use:** Liquorice root is an excellent demulcent, a mild relaxant, and is very helpful in cases of coughs, colds and bronchial irritations. Liquorice is also used in treatment of certain

viral infections, menstrual disorders, allergic disorders, asthma, depression caused by hormonal imbalance, hypoglycemia etc. (12).

## 5. HORSETAIL



Horsetail is a member of the Equisetaceae family; Roman physician Galen, several cultures have employed horsetail as a folk remedy for kidney, bleeding ulcers, and tuberculosis.

### **Chemical constituent & Uses:**

Because of its content of silica, this plant is recommended when it is necessary for the body to repair bony tissues. Silica helps to fix calcium, so that the body can store more quantity of this mineral and then use it to repair bones, collagen and other body tissues. Horsetail can therefore be useful for osteoporosis.

### **Horsetail Grass Benefits Those with Tuberculosis**

The horsetail stem contains equisetonin and potassium, both beneficial for body cleansing. It is also a source of calcium, magnesium, ascorbic acid and caffeic acid. But the greatest asset to make horsetail a leading herb as a diuretic is the chemical equisetonin. Because of this, horsetail can actually increase urination up to 30%. Horsetail has good quantities of calcium, silicon, chromium, magnesium, iron, manganese, and potassium. These make it effective in treating anemia (9).

## 6. EUCALYPTUS



**Synonyms:** *Dinkum oil, Lenon gum tree*

**Biological source:** Eucalyptus oil is the volatile oil obtained by the distillation of fresh leaves of *Eucalyptus globules*, family-Myrtaceae

**Chemical constituent:** Eucalyptus oil chiefly contains cineole (65%), also known as eucalyptol. also contain pinene, camphene, citronellal and traces of phellandrene.

**Use:** Eucalyptus oil can be used as an antiseptic gargle. Eucalyptus is a powerful antiseptic agent. Its powerful germicidal properties effectively kill staphylococcus bacteria and have been used to treat tuberculosis. Eucalyptus is used in Asia to treat TB (5).

## 7. ELECAMPANE



Elecampane (botanical name *Inula helenium*) is a tall, bristly perennial plant that is native to south-eastern Europe and western Asia.

The elecampane herb is also commonly known as 'Horseheal' and 'Scabwort' - both names derived from the plant's original medical use.

Elecampane - Used by native American Indians to treat lung disorders like TB (14).

## 8. HONEY



**Synonyms:** *madh*

**Biological source:** Honey is a viscid and sweet secretion stored in the honey comb by various species of bees such as *Apis indica* family-Apidae.

**Chemical constituent:** Moisture 14-24%, Dextrose, Levulose, Sucrose 0.4-6%, formic acid, succinic acid, vitamins, enzymes like invertase and inulase.

**Use:** Honey shows laxative, bactericidal and sedative characters. It is used for cold, cough, scurvy and to treat pulmonary tuberculosis (15).

### Supplements

TB patients taking antibiotics over a long period of time, will suffer from liver problems, this side effect can be rectified by consuming Vitamin B6 supplements. Chronic coughing weakens the mucus membrane – Vit A can help this condition. Additional minerals such as copper, zinc, selenium, magnesium and calcium are helpful in body's recovery.

## **ACQUIRED IMMUNO DEFICIENCY VIRUS**

AIDS is a medical condition. A person is diagnosed with AIDS when their immune system is too weak to fight off infections. Since AIDS was first identified in the early 1980s, an unprecedented number of people have been affected by the global AIDS epidemic. Today, there are an estimated 35.3 million people living with HIV and AIDS worldwide.

What causes AIDS?

HIV is a virus that gradually attacks immune system cells. As HIV progressively damages these cells, the body becomes more vulnerable to infections, which it will have difficulty in fighting off. It is at the point of very advanced HIV infection that a person is said to have AIDS. If left untreated, it can take around ten years before HIV has damaged the immune system enough for AIDS to develop.

### **Ayurvedic/ Herbal Treatment for HIV/AIDS**

An HIV positive person has to undergo extreme physical trauma, during the later stages of the infection. During this period, it continuously weakens your immune system. Once your immune system is weak, it strikes in the form of AIDS, giving the victim absolutely no chances of survival. Ayurveda is one such therapy. Studies have suggested that many natural components, used in Ayurveda can be very effective in the treatment of HIV.

Ayurveda is a traditional system of medicine, which originated in India, more than 6000 years ago. Ayurveda means the science or knowledge of life. Ayurveda makes use of a number of plants and herbs. These medicinal components are used individually as well as in combination and also with minerals, for treatment of a number of ailments, as well as for general health benefits (17).

The following are some of the herbs, which are commonly used for the treatment of HIV/AIDS:

**1. ASHWAGANDHA (*Withania somnifera*)**



**Synonyms:** Withania root, Asgandh, Winter cherry

**Biological source:** It consists of dried root and stem bases of *Withania somnifera* Linn, Family-Solanceae.

**Chemical constituent:** The main constituents are alkaloids and steroidal lactones. Withanine is main constituent. The other alkaloids are somniferine, somnine, somniferinine, withananine, pseudowithanine. The leaves contain lactone called as “withanolides”.

**Use:** Ashwandha has sedative and hypnotic effects. Ashwagandha or Indian ginseng, or Winter cherry has been traditionally used in Ayurveda, as a herb, which works to increase health and longevity. It is also considered to be a nontoxic herb that is said to normalize physiological function. Today, it is one of the most important components in HIV treatment (10).

**2. TULSI (*Ocimum sanctum*)**



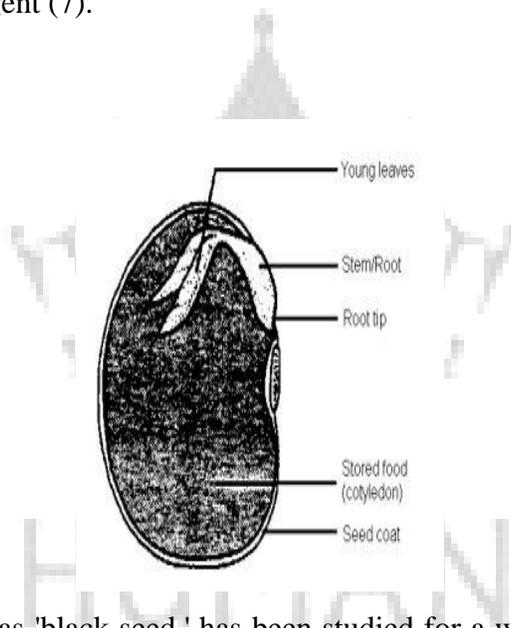
**Synonyms:** Sacred basil, Holy basil

**Biological source:** Tulsi consists of dried as well as fresh leaves of *Ocimum sanctum* Linn, family-Lamiaceae, and not less than 0.40% eugenol on dried basis.

**Chemical constituent:** volatile oil, 70% eugenol, 20% eugenol methyl ester, and it also contains glycosides, tannins, citric, tartaric acid and Vit. C.

**Use:** The oil is antibacterial and insecticidal. Tulsi extract has traditionally been used in Ayurveda, as a remedy for a number of ailments like common colds, headaches, stomach disorders, inflammation, heart disease, various forms of poisoning, and malaria. The drug is a good immunomodulatory agent (7).

### 3. BLACK SEED



*Nigella Sativa*, also known as 'black seed,' has been studied for a wide range of health benefits, but not until recently was it discovered to hold promise as a curative agent against potentially lethal viral infections, including Hepatitis C and now HIV.

A remarkable case study published in August of this year in the *African Journal of Traditional, Complementary, and Alternative Medicine* described an HIV patient who after undergoing treatment with a black seed extract experienced a complete recovery, with no detectable HIV virus or antibodies against HIV in their blood serum, both during and long after the therapy ended (6).

#### **4. 'TOPVEIN' CLAIM 99% CURE EFFICACY AGAINST HIV/AIDS**



There is a new herbal remedy available in Zimbabwean market called Topvein, and it claims to cure with 99 percent success rate against HIV/AIDS. In addition, the drug also claims to cause no side effects on the blood chemistry, lung and kidney functions, based on their official report. Topvein curing claims against HIV

Topvien herbal medicine could cure AIDS within a year of use by boosting and improving the CD4 and CD8 immune cell counts on the patient.

He also said that Topvein is something which can be used for HIV/AIDS treatment alongside antiretroviral drugs, but patients may experience some drowsiness and yellowish stool and urine. According to the Topvein here are the official clinical effects of using the drug:

1. Increase in body weight.
2. Increase in appetite.
3. No opportunistic infections such as meningitis, tuberculosis, sexually transmitted infection and diarrhoea.

Increase in CD4 cell count by 99 percent (14).

#### **5. SHATAVARI**



**Synonyms:** *Shatmuli*

**Biological source:** Shatavari consists of dried roots and leaves of the plant known as *Asparagus racemosus* Wild, family Liliaceae (6).

**Chemical constituent:** Shatavari roots contain 4 steroid saponins: shatavarin 1. Shatavarin 1 major glycoside with 3 glucose and rhamnase moieties attached to sarsapogenin, whereas shatavari 4 two glucose and one rhamnase moieties are attached. Leaves contain diosgenin and quercetin.

**Use:** Shatavari root are used to stimulate immune system and also used as diuretic (21).

**Common Herbal drugs used in treatment of Tuberculosis & Acquired Immuno Deficiency Virus:**

## 1. INDIAN GOOBERRY



**Synonyms:** Emblica, Amla

**Biological source:** This consists of dried, as well as fresh fruits of the plant *Emblica officinalis* Gaerth belonging to family Euphorbiaceae.

**Composition:** Vitamin C (ascorbic acid), 0.5% fat, phyllembin, 5% tannin also contains iron and calcium.

**Use:** 1. Amla is one of the natural sources of vitamin C. Indian gooseberry is highly beneficial for the reproductive systems of both men and women. It helps in regulating the menstrual cycle in women.

It helps to treat respiratory disorders. Indian gooseberry is a medicinal tonic, which helps in the treatment of respiratory disorders such as tuberculosis of lungs, bronchitis and asthma.

Amalaki or amla, or Indian gooseberry, is the richest known source of Vitamin C, which plays a very vital role in enhancing the immune system of the body. It has traditionally been used for curing number of diseases, such as cancer, age-related renal disease, and diabetes. Nowadays, it is also used for the treatment of HIV (5).

## 2. ASTRAGALUS



**Common Name(s):** Huang chi, huang qi, astragalus

**Use:** Astragalus root may have use in the restoration of immune function after cancer chemotherapy and for the treatment of HIV infection. However, there are no clinical trials to support any of these uses (22).

One study provides evidence that Astragalus polysaccharides (APS) and astragalosides (AS) have strong promoting effects on the phagocytosis of *M. tuberculosis*.

## CONCLUSION

Herbal and conventional medicine are part of a healing spectrum, in which each has something positive but different to offer. Although conventional medicine's high-technology approaches are especially useful in treating acute disease and in emergency care, herbal medicine by supporting wellness is more suitable for dealing with the chronic ailments that are increasingly affecting modern society. Because herbal medicine addresses an important healthcare need, its continued integration into mainstream medicine should benefit everyone, including people with disabilities. For others, herbs are used as adjunct therapy to conventional pharmaceuticals. However, in many developing societies, traditional medicine of which herbal medicine is a core part is the only

system of healthcare available or affordable. Regardless of the reason, those using herbal medicines should be assured that the products they are buying are safe and contain what they are supposed to, whether this is a particular herb or a particular amount of a specific herbal component. Consumers should also be given science-based information on dosage, contraindications, and efficacy. To achieve this, global harmonization of legislation is needed to guide the responsible production and marketing of herbal medicines. If sufficient scientific evidence of benefit is available for an herb, then such legislation should allow for this, to be used appropriately to promote the use of that herb so that these benefits can be realized for the promotion of public health and the treatment of disease.

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