



## Ayurvedic Medicinal Plants for Immunity Boosters -an overview

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### ABSTRACT

Ayurveda is the oldest system of medicine and native to India in which 1200 diseases are mentioned. Ayurvedic system comprising of traditional medicine have immunostimulation, tonic, neurostimulation, anti-ageing, antibacterial, antiviral, anti-rheumatic, anticancer and adaptogenic attributes. They are used in preventive health, environmental health, public health, pharmaceuticals and therapeutics. Ayurvedic plants containing aromatic compounds such as glycosides, flavonoids, coumarins, sapogenins, alkaloids, thiosulfinates, volatile oils and terpenoids exert strong immunomodulatory activity. In this review, 38 ayurvedic medicinal plants having immunity enhancing properties are discussed in details.

### 1. Introduction

India has six recognized systems of medicine i.e. Ayurveda, Siddha, Unani, Yoga, Naturopathy and Homoeopathy (Vaidya and Devasagayam, 2007). Ayurveda is the oldest system of medicine and native to India, but Unani system of medicine originated in Greece and has been introduced by the Arabs in India. Ayurvedic system of medicine is based on three dosas (Vata, Pitta and Kapha).

It has been reported that 1200 diseases are mentioned in different classical in Ayurveda (Kumar *et al.*, 2007). Atharvaveda (around 1200 BC), Charak Samhita and Sushrut Samhita (1000-500 BC) are the main classic collections of literature of 700 medicinal herbs (Chulet and Pradhan, 2010). Ayurvedic system comprising of traditional medicine have served as a source of alternative medicine, new pharmaceutical and health-care products with immunostimulation, tonic, neurostimulation, anti-ageing, antibacterial, antiviral, anti-rheumatic, anticancer and adaptogenic attributes (Agarwal and Singh, 1999).

#### **Application of aroma therapy in Ayurveda**

Ayurvedic literatures mention a wide range of applications of Aroma in Health Care System such as preventive health, environmental health, public health, pharmaceuticals and therapeutics.

#### **Applications in preventive health**

- Utility of garlands enriched with aromatic flowers as a part of daily regime (Ch. Su. 5/96)
- Inhaling flavors/fumes of aromatic medicinal plants as a daily regime
- Prescribed to stay in gardens having aromatic flowers in summer seasons as a part of seasonal regime
- Fumigation of clothing with aromatic plants/products
- Avoidance of exposure to excessive/improper

#### **Applications in environmental and public health**

- Purification of water with aromatic herbs
- Fumigating the environment with aromatic plants/products to prevent epidemics/infectious diseases
- Sterilizing the labour rooms, Pediatric wards & OTs with antimicrobial aromatic plants (*Dashang Dhoopa*)

#### **Application in pharmaceuticals**

- Addition of aromatic excipients/ Treatment of distillates of aromatic medicinal herbs according to targeted indications (*Arka*)

For Vata Disorders : Guggulu

For Pitta Disorders : Chandana

For Kapha Disorders : Jatamamsi

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- Use of aromatic excipients for patients' compliance/acceptability
- Treating the oils with aromatic plants/products before utilizing them for manufacture (*taila and ghrta murchana*)

#### **Applications in therapeutics**

- Fumigation for wound-healing
- Fumigation to prevent & manage infectious & contagious diseases
- Induction of emesis (*Madanaphala-Lotus*)
- Aphrodisiac agents
- Nasal Administration of certain medicaments
- Management of headache
- Management of psychotic disorders to restore the consciousness  
e.g. Restoring consciousness of *Lakshman* is an example of application of aromatic nasal medicaments as narrated in *Ramayana*.

#### **Importance of medicinal herbs in immune systems**

According to World Health Organization, more than 75% of the population depends on herbs used as traditional

remedies for primary health-care (Diallo *et al.*, 1999). Herbs, which affect any constituents or function of the immune system in a specific or non-specific manner including both innate and adaptive ways of the immune response are designated as immunomodulatory herbs (Agarwal and Singh, 1999). They play important role in immunodeficiency disorder (Ziauddin, 1996), infections (van der Meijden, 2001), inflammations (Schulze-Koops, 1999) and cancer Chada *et al.*, 2003) based upon their action on cytokines, interleukins, lymphocytes etc. However, they may exert its action as immune adjuvant (Billiau and Matthys, 2001) or immunosuppressant (Juyal and Singla, 2013) or immunostimulant (EL Sheikh A, 2008) beneficial in improving the efficacy of vaccines by acting on cellular immunity and increase body resistance acting on both arms of immune responses respectively.

#### **Immunomodulatory chemistry in ayurvedic plants**

It has been found that plants containing phytoconstituents such as glycosides, flavonoids, coumarins, sapogenins, alkaloids, thiosulfates, volatile oils and terpenoids exert strong immunomodulatory activity (Kumar *et al.*, 2012). Aromatic compounds and their therapeutic properties responsible for immunity development are given table 1.

**Table 1. Aromatic compounds and their uses**

<b>Chemical Compounds</b>	<b>Therapeutic Properties</b>
<b>Aldehydes</b>	Releasing, calming and sedative, Anti-inflammatory Anti-septic, Anti-microbial
<b>Phenols</b>	Highly anti-septic and anti-microbial Stimulating immune system
<b>Sesquiterpenol</b>	Mood balancing, Anti-inflammatory Immune system enhancer
<b>Ketones</b>	Mind relaxer, Mucolytic and expectorant supporting respiratory system, Stimulates cell regeneration
<b>Esters</b>	Mind relaxer, Anti-spasmodic, Anti-fungal
<b>Alcohol</b>	Anti-bacterial, Anti-viral
<b>Monoterpenes</b>	Detoxifying, Diuretic, Anti-septic, Anti-viral, Anti-inflammatory Analgesic, Anti-spasmodic, Immunity stimulator
<b>Azulene</b>	Anti-histaminic, Highly anti-inflammatory, Promoting healing
<b>Bisabolol</b>	Is the strongest sesquiterpene, Anti-bacterial, Anti-fungal, Anti-inflammatory
<b>Flavonoids</b>	Immunity enhancer, Anti-cancer, Preventing cardio-vascular disorders, Improves circulation, Maintains healthy status
<b>Farnesol</b>	Highly anti-inflammatory, Anti-bacterial
<b>Farnesence</b>	Highly anti-viral
<b>Limonene</b>	Highly anti-viral
<b>Terpene alcohols</b>	Highly anti-bacterial, Immunity enhancer
<b>Terpene hydrocarbons</b>	Highly anti-viral
<b>Thujone</b>	Mucolytic and expectorant, Immunity enhancer

**Medicinal plants in ayurvedic medicine** (De, 2017)

**Scientific name:** *Acorus calamus* Linn.

**Family:** Araceae

**Name of Drug:** Vaca

**Distribution:** Throughout India and Sri Lanka in marshes, wild or cultivated in Sikkim, also distributed in north temperate and warm regions.

**Active ingredients:** Alpha and beta asarone, acorine, acoradine

**Parts used:** Rhizome

**Medicinal uses:** The drug is useful in treatment of bronchial asthma, indigestion, diarrhoea, dysentery, abdominal obstruction and colic, hysteria, insanity. It is also said to be useful in improving intellect and memory power.

**Scientific name:** *Andrographis paniculata* Wallich ex. Nees.

**Family:** Acanthaceae

**Name of Drug:** Kiratattikah

**Distribution:** In shady places of tropical forests in India and Sri Lanka. Cultivated in East and West Indies.

**Active ingredients:** Sodium chloride, tannic acid, isoprenaline, andrographolide, penicilides

**Parts used:** Leaves and stems

**Medicinal uses:** The drug is used in fever, burning sensation, thirst, cough, cold, diarrhoea, sore throats, oedema, ulcer, worms and difficulty in breathing.

**Scientific name:** *Aristolochia indica* Linn.

**Family:** Aristolochiaceae

**Name of Drug:** Iswari

**Distribution:** India, Sri Lanka, Nepal, Bangladesh

**Active ingredients:** Aristolochic acid, aristolic acid, aristolic acid methyl ester, methyl aristolochate, aristolamide, aristolinic acid, aristolonitrite.

**Parts used:** Roots, rhizomes and leaves

**Medicinal uses:** The plant is used in skin diseases where there is morbidity of vata, pitta and kapha. It is used as an appetiser, aphrodisiac and anthelmintic. The fresh juice of the leaves is a popular antidote to snake poison. The leaves and bark are used in bowel complaints of children, diarrhoea and in intermittent fevers. In traditional medicine the underground parts of the plant are rubbed with honey and given to treat leprosy; and, macerated with black pepper, it is prescribed in diarrhoea.

**Scientific name:** *Azadirachta indica* A. Juss.

**Family:** Meliaceae

**Name of Drug:** Nimbh

**Distribution:** Neem is grown in tropical and semi-tropical regions of India, Myanmar, Bangladesh, Sri Lanka, Malaysia and Pakistan.

**Active ingredients:** Azadirachtin, nimbinene, 6-desacetylnimbinene, nimbandiol, nimbolide, p-sitosterol,

salannin, gedunin, azadirone, nimbin, nimbidine, nimbicidine, nimbinol

**Parts used:** Seeds, leaves, flower and bark

**Medicinal uses:** Neem products are proved to be anthelmintic, antifungal, anti-diabetic, antibacterial, antiviral, anti-fertility and sedative. Neem tree is generally considered to be an air purifier and preventive against malarial fever, acne, pimples and cholera. The leaves are useful in relieving flatulence, promoting the removal of catarrhal matter and phlegm from the bronchial tubes, and in increasing secretion and discharge of urine. They also act as an insecticide. The bark is a bitter tonic and a stimulant. It arrests secretion and bleeding besides counteracting any spasmodic disorders.

**Scientific name:** *Bacopa monnieri* Linn.

**Family:** Scrophulariaceae

**Name of Drug:** Brahmi

**Distribution:** It is found as weed in marshy low lands or wet lands, in plains of India.

**Active ingredients:** Brahmine, herpestine, hersaponin, monnierin

**Parts used:** Whole plant

**Medicinal uses:** The entire plant is highly valued for improving intelligence and memory and revitalization of sense organs. The drug is astringent, laxative, tonic, sweet and cold. It is employed for clearing voice and improving digestion. It is effective in cases of anxiety, neurosis, emancipation and insanity. The drug is useful for diabetes, cough, fever, arthritis, anorexia, dyspepsia, dermatosis, dropsy, heart and nerve trouble.

**Scientific name:** *Bauhinia variegata* Linn.

**Family:** Caesalpinaceae

**Name of Drug:** Kanchanarah

**Distribution:** China, Colombia, India, Myanmar, Nepal, Pakistan, Thailand, Vietnam

**Active ingredients:** Biflavone, 5,7-dimethoxy-30, 40-methylenedioxy flavone and a new dihydrodibenzoxepin, 5,6-dihydro-1,7-dihydroxy-3,4-dimethoxy-methyl dibenzoxepin, flavonolglycoside, triterpene saponin, phenanthraquinone, flavonoids.

**Parts used:** Bark, buds and leaves

**Medicinal uses:** The buds and barks are alterative and astringent. The decoction of bark is used for treating of leprosy, worm infections, scrofula, ulcers and other skin diseases. Decoction of flower bud is used for the treatment of bleeding piles, blood in urine, and bleeding from mucous surface. The flowers have laxative action. Leaves are nutritive and anti-diabetic.

**Scientific name:** *Boerhaavia diffusa* Linn.

**Family:** Nyctaginaceae

**Name of Drug:** Punarnava

**Distribution:** It is found in plains of India during rainy season as weed in sandy tracts, Punjab, Assam and tropical and subtropical Asia.

**Active ingredients:** Punarnavine, purine-nucleoside, punarnavoside

**Parts used:** Whole plant

**Medicinal uses:** It is a rejuvenative medicine and stimulates function of heart and kidneys. It is also anti-inflammatory and antiarthritic. This medicinal plant is used to improve eyesight. It has diuretic properties which is useful in controlling blood sugar levels in diabetic patients.

**Scientific name:** *Butea monosperma* (Lam.) Taub.

**Family:** Fabaceae

**Name of Drug:** Palash

**Distribution:** India, Sri Lanka, Myanmar

**Active ingredients:** Beta-sitosterol, amyirin, bitulinic acid, stigmaterol, palasonin, butrin, isobutrin, leucocyanidin

**Parts used:** Seeds, gums, leaves, flowers and bark

**Medicinal uses:** Seeds are diuretic, purgative and anti-parasitic. Flowers and leaves are diuretic, astringent, aphrodisiac and anti-diarrhoeal. Tree bark gum is astringent and useful in haemorrhage. Roots are used to treat night blindness. Leaves are used to reduce blood sugar and diabetes.

**Scientific name:** *Cissampelos pareira* Linn.

**Family:** Menispermaceae

**Name of Drug:** Patha

**Distribution:** Southern India

**Active ingredients:** Oxo-aporphines, palmatine and isoquinolines

**Parts used:** Whole plant

**Medicinal uses:** The drug is used for the treatment of oedema, cystitis, kidney inflammation, intestinal worms and fever. Besides, it is also used as an infertility agent. It is helpful with symptoms associated with menstruation and balancing hormones in women.

**Scientific name:** *Clerodendrum serratum* Linn.

**Family:** Verbenaceae

**Name of Drug:** Bharangi

**Distribution:** Native of East India and Malasiya. Distributed throughout in forests of Sri Lanka and India.

**Active ingredients:** Sapogenin, Flavonoids and phenolic acids

**Parts used:** Barks, leaves

**Medicinal uses:** Root is pungent, bitter, acrid, dry, heating, anti-inflammatory, digestive, carminative, depurative, expectorant, antispasmodic, stimulant, appetizer and anthelmintic. It is used clinically in treatment of bronchitis,

asthma, fevers, blood disease, tumours, inflammations, burning sensation, epilepsy, malaria, ulcer and wounds. Leaves are used in fever and hiccup.

**Scientific name:** *Centella asiatica* Urban.

**Family:** Apiaceae

**Name of Drug:** Mandukaparni

**Distribution:** Shady moist or wet locations in tropical and sub-tropical India

**Active ingredients:** Asiaticoside, brahmoside, asiatic acid, brahmic acid, centellose, centelloside

**Parts used:** Whole plant

**Medicinal uses:** The entire plant is cardi tonic, astringent and diuretic. It improves memory. The drug is employed in anaemia, diabetes, indigestion, nervous strengthening, insanity and cough.

**Scientific name:** *Citrullus colocynthis* Schrad.

**Family:** Cucurbitaceae

**Name of Drug:** Indravaruni

**Distribution:** Southern India, tropical and subtropical North Africa and Asia.

**Active ingredients:** Cucurbitacin, fatty acids

**Parts used:** Roots and fruits

**Medicinal uses:** The fruit is purgative, bitter, hot, abortifacient and cathartic. The root is said to be effective in cough, asthma, abdominal enlargement, inflammation of breasts, ulcers, rheumatism and urinary diseases.

**Scientific name:** *Convolvulus pluricaulis* Choisy.

**Family:** Convolvulaceae

**Name of Drug:** Sankhapuspi

**Distribution:** Bihar and plains of West Bengal

**Active ingredients:** B. sitosterol glycoside, hydroxy cinnamic acid, octacosanol tetracosane, glucose

**Parts used:** Whole plant

**Medicinal uses:** The drug cures uterine disorders, epilepsy, dysuria, diabetes, coughs and intestinal worms. It is also tranquilising and anti-thyroid. The whole herb is used medicinally in the form of decoction with cumin and milk in fever, nervous debility, and loss of memory.

**Scientific name:** *Costus speciosus* Smith.

**Family:** Zingiberaceae

**Name of Drug:** Canda

**Distribution:** Central and eastern Himalayas, Malaya Islands, Sri Lanka, Taiwan, Indo-China to New Guinea

**Active ingredients:** Diosgenin

**Parts used:** Roots and rhizomes

**Medicinal uses:** The rhizomes are bitter, astringent, acrid, cooling, aphrodisiac, purgative, anthelmintic, depurative, febrifuge, expectorant, tonic, improve digestion, and is a stimulant herb that clears toxins. It also has anti-fertility,

**Medicinal uses:** The rhizomes are bitter, astringent, acrid, cooling, aphrodisiac, purgative, anthelmintic, depurative, febrifuge, expectorant, tonic, improve digestion, and is a stimulant herb that clears toxins. It also has anti-fertility, anabolic properties. Rhizomes are also given in diseases as pneumonia, rheumatism, dropsy, urinary diseases, jaundice, and leaves are given in mental disorders.

**Scientific name:** *Curculigo orchioides* Gaertn.

**Family:** Hypoxidaceae

**Name of Drug:** Musali

**Distribution:** Peninsular India, Khasi hills and the subtropical Himalayas.

**Active ingredients:** Curculigoside, polysaccharides, yuccagenin, sapogenin, lycorin, hentriacontanol, sitosterol.

**Parts used:** Roots, flowers

**Medicinal uses:** Rootstocks are sweet, cooling, diuretic aphrodisiac, virilogenic and effective in skin diseases, asthma, bronchitis, jaundice, diarrhoea, dyspepsia, ophthalmia and lumbago.

**Scientific name:** *Curcuma longa* Linn.

**Family:** Zingiberaceae

**Name of Drug:** Haridra

**Distribution:** Throughout tropical India

**Active ingredients:** Curcumin, sesquiterpenes

**Parts used:** Rhizome

**Medicinal uses:** The drug is used as antiseptic, aromatic, anti-rheumatic, anti-inflammatory, alterative, carminative, vermifuge, stimulant and tonic. It is used as a facial tonic and also skin diseases, eczema, itching, ringworm, chicken pox, small pox, cold and cough, conjunctivitis, liver affections and bronchitis.

**Scientific name:** *Desmodium triflorum* DC.

**Family:** Papilionaceae

**Name of Drug:** Hamsapadi

**Distribution:** Found as weeds in plains of India

**Active ingredients:**  $\beta$ -phenylamine (major), indole-3-acetic acid, tyramine, trigonelline, hypaphorine

**Parts used:** Whole plant

**Medicinal uses:** The entire plant is regarded as diuretic, carminative and tonic. It is also used in bilious complaints, skin diseases, cough, asthma, diarrhoea and convulsions. The plant juice is applied to wounds or abscesses for quick healing.

**Scientific name:** *Eclipta prostrata* Linn.

**Family:** Asteraceae

**Name of Drug:** Bhrngarajah

**Distribution:** Wet and moist lands of India

**Active ingredients:** Wedelolavone

**Parts used:** Whole plant

**Medicinal uses:** The leaf extract is considered liver tonic, rejuvenative and good for hair. The entire plant is used for headache, night blindness, asthma, jaundice, urinary infections and intestinal worms.

**Scientific name:** *Elephantopus scaber* Linn.

**Family:** Asteraceae

**Name of Drug:** Gojihva

**Distribution:** Throughout India, Myanmar, Sri Lanka, Africa, Malaya Peninsula, Indo-China, tropical Asia and America

**Active ingredients:** Germacranolide, elephantopin and quinic acid esters

**Parts used:** Roots, flowers and leaves

**Medicinal uses:** The herb is diuretic, laxative, analgesic, alterative, febrifuge, cardiac and brain tonic; used in griping, inflammations and bronchitis. Root is used in fever and to arrest vomiting. Leaves are used in piles. Bruised leaves boiled in coconut oil are applied to ulcers and eczema. The flowers are aphrodisiac, tonic and expectorant; cures biliousness, liver troubles and cough. Decoction of the roots and leaves are emollient; given in dysuria, diarrhoea and dysentery. Root paste is applied in rheumatism, and with mustard oil given in amoebic dysentery.

**Scientific name:** *Euphorbia hirta* Linn.

**Family:** Euphorbiaceae

**Name of Drug:** Dugdika

**Distribution:** It is found as weed in plains of India

**Active ingredients:** Euphorbianin, leucocyanidol, camphol, quercitrin, quercitol, gallic acid, myricitrin, euphorbins,  $\beta$  amyrrin

**Parts used:** Whole plant

**Medicinal uses:** The plant has been used for female disorders but is now more important in treating respiratory ailments, especially cough, coryza, bronchitis and asthma. In India, it is used to treat worm infestations in children and for dysentery, gonorrhoea, jaundice, pimples, digestive problems and tumour. The fresh milky latex is applied to wounds and warts and the root of the plant is used in sprains and inflammation, miscarriage, epilepsy, maggots in wounds and irregular growth of teeth.

**Scientific name:** *Holarrhena anti-dysenterica* Linn.

**Family:** Apocynaceae

**Name of Drug:** Kutaja/Kurchi

**Distribution:** India and other Asian countries.

**Active ingredients:** Conessine, conessimine, kurchine, conamine, conimine, conessidine, conarrhimine, holarrhimine, holarrhine and kurchicine.

**Parts used:** Stem, root bark and seeds

**Medicinal uses:** Kutaja is primarily used for the treatment of dysentery but has several other therapeutic usages. It is particularly useful in bleeding disorders such as menorrhagia, haemorrhoids, diabetes and oedema and has been used for tumours, abscesses, aches and pains, bronchitis, colic, diarrhoea, splenitis and as a vermifuge, laxative and astringent. The bark is useful in treatment of piles, skin diseases and biliousness.

**Scientific name:** *Hemidesmus indicus* Linn.

**Family:** Asclepiadaceae

**Name of Drug:** Sariva

**Distribution:** South Asia

**Active ingredients:** *Essential oil, Starch, Coumarin, Tannic acid, Triterpenoid saponins*

**Parts used:** Roots

**Medicinal uses:** It is used as a healing herb as well as a magical-spiritual dream herb. It is used to treat stomach problems, cure rashes, ease the mind, quell the symptoms of syphilis, induce trance states and deep meditation, and to clarify and prepare the mind for the dream world. Ayurvedic healers also prescribed it to men suffering from low libido and sexual impotence, it is believed that one of active compounds produced by the roots improves male testosterone levels and therefore sexual desire, sperm count, and overall sexual performance.

**Scientific name:** *Ipomoea digitata* Auct.

**Family:** Convolvulaceae

**Name of Drug:** Vidari

**Distribution:** Tropical and humid regions of India

**Active ingredients:** Pterocarpan tuberosin, pterocarpanone hydroxyl tuberosone

**Parts used:** Tuber

**Medicinal uses:** Raw tuber is taken for treating blood dysentery and used as astringent. Sun dried root powder, boiled in sugar and butter is recommended to promote weight gain, and to regulate menstrual discharge. Tubers are also used for the treatment of debility, spermatorrhoea, fever, bronchitis, scorpion stings and menorrhagia. The drug is also used for treatment of liver and spleen enlargement.

**Scientific name:** *Lagenaria siceraria* Standly

**Family:** Cucurbitaceae

**Name of Drug:** Iksvakuh

**Distribution:** It is cultivated as vegetable crop in hotter parts of India. The species inhabits tropical Asia and Africa.

**Active ingredients:** Cucurbitacins, fructose and glucose

**Parts used:** Whole plant

**Medicinal uses:** The fruits, leaves, stem, seeds and oils are traditionally used in the treatment of jaundice, diabetes, ulcer, piles, colitis, insanity, hypertension, congestive cardiac failure, and skin diseases. The fruit pulp is used as an emetic,

sedative, purgative, cooling, diuretic, antibilious, and pectoral. The flowers are an antidote to poison. The stem bark and rind of the fruit are diuretic. The seed is vermifuge. Extracts of the plant have shown antibiotic activity. Leaf juice is widely used for baldness. The plant juice is an excellent remedy for heart problems, digestive and urinary disorders, and in diabetes. The juice prevents excessive loss of sodium, satiating thirst, and giving a cooling effect. Probably, the bitter principle found in the wild bottle gourds is responsible for the purgative property. Crushed leaves are used for baldness and applied on the head for the headache. Leaves are also used as alternative purgative. Fruit is rich source of water and minerals and are believed to possess vitamin A, C and B complex. Bottle gourd is believed to help the liver function in a balanced fashion. The juice from the leaves help cure jaundice and the juice from the gourd helps reduce graying of hair. The gourd juice helps treat burning sensation in the urinary passage if consumed with lime juice. It reduces fatigue and keeps you fresh, especially during summer. It helps fight constipation, as it is fibre rich. Because of its fibre and low fat content, Ayurveda highly recommends this food for diabetic patients and young children. Ayurveda also recommends the juice of this gourd in the treatment of acidity, indigestion and ulcers as it serves as an alkaline mixture. Indian traditional medicine claims that bottle gourd acts as a nerve tonic and can help improve obsessive compulsive disorder (OCD).

**Scientific name:** *Leptadenia reticulata* Wt. and Arn.

**Family:** Asclepiadaceae

**Name of Drug:** Jivanti

**Distribution:** Found in the sub-Himalayan tracts of Punjab and Uttarakhand and throughout the Deccan peninsula up to an altitude of 900 m and found particularly in hedges. It is also distributed throughout Mauritius, Madagascar, Sri Lanka, the Himalayas and Burma.

**Active ingredients:** Stigmasterol, a-amyrin, tocopherols, hentriacontanol, leptadeno and sitosterol.

**Parts used:** Whole plant

**Medicinal uses:** It corrects the metabolism and enhance the nutritive status of the body and corrects the digestive system; it specially nourishes the eyes and the reproductive system. Jivanti is a cardio tonic and cures bleeding disorders. It is also used in bronchitis as an expectorant, an aphrodisiac and improves seminal quality through its specific action on the reproductive organs, used in spermatorrhoea, in dysuria, burning micturition and pyuria and it also benefits in fever, burning and also in defective eyesight.

**Scientific name:** *Luffa cylindrica* M. J. Roem.

**Family:** Cucurbitaceae

**Name of Drug:** Kosataki

**Distribution:** Coastal districts and tropical parts of India

**Active ingredients:** Triterpenoid saponins

**Parts used:** Leaves, flowers and fruits

**Medicinal uses:** Plant is bitter tonic, emetic, diuretic and purgative and useful in asthma, skin diseases and splenic enlargement. It is used internally for rheumatism, backache, internal haemorrhage, chest pains as well as haemorrhoids. Externally, it is used for shingles and boils. The dried fruit fibres are used as abrasive sponges in skin care, to remove dead skin and to stimulate the circulation. The fruits are anthelmintic, carminative, laxative, depurative, emollient, expectorant, tonic and galactagogue and are useful in fever, syphilis, tumours, bronchitis, splenopathy and leprosy. Fruit is intensely bitter and fibrous. It has purgative property and is used for dropsy, nephritis, chronic bronchitis and lung complaints. It is also applied to the body in putrid fevers and jaundice.

**Scientific name:** *Mallotus philippensis* Muell.-Arg.

**Family:** Euphorbiaceae

**Name of Drug:** Kampillakah

**Distribution:** Throughout India

**Active ingredients:** Phenols, diterpenoids, steroids, flavonoids, cardenolides, triterpenoids, coumarins, isocoumarin

**Parts used:** Leaves and fruits

**Medicinal uses:** The leaves are bitter, cooling and appetizer. Fruit is heating, purgative, anthelmintic, vulnerary, detergent, maturant, carminative, alexiteric and useful in treatment of bronchitis, abdominal diseases, spleen enlargement.

**Scientific name:** *Moringa oleifera* Linn.

**Family:** Moringaceae

**Name of Drug:** Sigrū

**Distribution:** Tropical and subtropical parts of India

**Active ingredients:** Zeatin, quercetin, beta-sitosterol, caffeoylquinic acid and kaempferol.

**Parts used:** Leaves, flowers, seeds, roots, barks and fruits

**Medicinal uses:** It acts as cardiac and circulatory stimulants, possess antitumor, antipyretic, antiepileptic, antiinflammatory, antiulcer, antispasmodic, diuretic, antihypertensive, cholesterol lowering, antioxidant, antidiabetic, hepatoprotective, antibacterial and antifungal activities, and are being employed for the treatment of different ailments in the indigenous system of medicine. Leaves are effective against headache, healing of wounds, fevers, bronchitis, ulcers, diarrhoea, skin diseases and anaemia. Flowers are useful for enhancement of breast milk, cold and urinary problems. Pods are used in de-worming, liver problems, joint pains and diarrhoea. Seeds are used for their antibiotic and anti-inflammatory properties to treat

arthritis, rheumatism, gout, cramp, sexually transmitted diseases and boils. The roots and bark are used for cardiac and circulatory problems, as a tonic and for inflammation.

**Scientific name:** *Plumbago zeylanica* Linn.

**Family:** Plumbaginaceae

**Name of Drug:** Chitrakah

**Distribution:** South –East Asia

**Active ingredients:** Plumbagin, chitranone, zeylanone, zeylinone

**Parts used:** Bark

**Medicinal uses:** It is one of the powerful digestive and carminative herbs of Ayurveda. It is used in most of Ayurvedic medicines for indigestion.

**Scientific name:** *Psoralea corylifolia* Linn.

**Family:** Papilionaceae

**Name of Drug:** Bakuchi

**Distribution:** It is found as weed during rainy season in different parts of India. The species is distributed in India, Sri Lanka, China, Myanmar, Pakistan and Arabia.

**Active ingredients:** Sugar, albumin, traces of manganese, limonene, corylin, psoralene,

**Parts used:** Seeds, fruits and roots

**Medicinal uses:** *Psoralea corylifolia* is valued in Chinese herbal medicine as a tonic remedy and is used to improve general vitality. It is also of value in the treatment of skin disorders, including vitiligo. The one-seeded fruits are highly regarded as an aphrodisiac and tonic to the genital organs. The seed is anthelmintic, antibacterial, aphrodisiac, astringent, cardiac, cytotoxic, deobstruent, diaphoretic, diuretic, stimulant, stomachic and tonic. It is used in the treatment of febrile diseases, premature ejaculation, impotence, lower back pains, frequent urination, incontinence, bed wetting etc. The root is used for treating dental caries. The plant yields a useful medicinal oleoresin which treats kidney disorders, impotence, lumbago. It is also used externally to treat various skin ailments including leprosy, leucoderma and hair loss. The antibacterial action of the fruit inhibits the growth of *Mycobacterium tuberculosis*.

**Scientific name:** *Saraca indica* Roxb.

**Family:** Caesalpiniaceae

**Name of Drug:** Asokah

**Distribution:** India, Burma and Malaya

**Active ingredients:** Epicatechin, catechin, leucocyanidin, sitosterol

**Parts used:** Bark, seeds

**Medicinal uses:** The bark of Ashoka Tree is used for its medicinal value and it is reported to have a stimulating effect on the endometrium and ovarian tissue. The bark is useful in all cases of uterine bleeding where ergot is indicated. It is

also useful in menorrhagia due to uterine fibroids, in leucorrhoea and in internal bleeding.

**Scientific name:** *Sida cordifolia* Linn.

**Family:** Malvaceae

**Name of Drug:** Bala

**Distribution:** It is distributed as weed in West Bengal, Maharashtra, Kerala, Karnataka and also in Myanmar.

**Active ingredients:**  $\beta$ -phenethylamine, ephedrine, pseudo-ephedrine, S-(+)-N<sub>6</sub>-methyltryptophan methyl ester, hypaphorine, vasicinone, vasicinol, choline, and betaine.

**Parts used:** Roots

**Medicinal uses:** It is administered in facial paralysis, hemiplegia, leucorrhoea, diabetes, asthma, bronchitis, rejuvenating tonic, libido enhancing and anti-inflammatory

**Scientific name:** *Solanum nigrum* Linn.

**Family:** Solanaceae

**Name of Drug:** Kakamachi

**Distribution:** It is found as weed in different parts of India and also found in Sri Lanka and all temperate and tropical parts of the world.

**Active ingredients:** Solasodine

**Parts used:** Fruit and whole plant

**Medicinal uses:** It is considered for good for cooling hot inflammation, ringworm, ulcer, testicular swellings, gout and ear pain. It is very good mouth sores and ulcers. Leaves and stems are diuretic. The juice of leaves is good for flatulence, peptic ulcers, painful periods, inflamed scrotum, testicles and dysentery. The leaves and fruits are said to cure fever. The berries and flowers are good for cough and cold.

**Scientific name:** *Sphaeranthus indicus* Linn.

**Family:** Asteraceae

**Name of Drug:** Hapusa

**Distribution:** Wet lands of India, Myanmar, Malaysia, Australia and Sri Lanka

**Active ingredients:** Eudesmanolide, sterol glycosides, sesquiterpenolactones, flavonoids

**Parts used:** Whole plant

**Medicinal uses:** This herb is hot, laxative, digestible, tonic, fattening, alterative, anthelmintic and alexipharmic. It is used in insanity, tuberculosis, indigestion, bronchitis, spleen diseases, elephantiasis, anaemia, pain in uterus and vagina, piles, asthma, leucoderma, dysentery, vomiting and hemicranias

**Scientific name:** *Syzygium cumini* Linn.

**Family:** Myrtaceae

**Name of Drug:** Jambuah

**Distribution:** India, Bangladesh, Nepal, Pakistan, Malaysia, the Philippines, Indonesia

**Active ingredients:** Jambosine, jambolin, kaempferol, myrecetin

**Parts used:** Fruits, seeds

**Medicinal uses:** It is effective in the treatment of diabetes mellitus, inflammation, ulcers and diarrhoea. The leaves are antibacterial, and are used for strengthening the teeth and gums. The fruit and seeds are sweet, acrid, sour, tonic, and cooling, and are used in diabetes, diarrhoea and ringworm. The bark is astringent, sweet sour, diuretic, digestive and anthelmintic.

**Scientific name:** *Tinospora cordifolia* (Willd) Hook. f and Thoms.

**Family:** Menispermaceae

**Name of Drug:** Amrita

**Distribution:** India, Sri Lanka and Myanmar

**Active ingredients:** Columbin, tinosporaside, jatrorrhizine, palmatine, berberine, tinocordifolioside, tinosporic acid, tinosporal, and tinosporon

**Parts used:** Whole plant

**Medicinal uses:** The drug is used for the treatment of fever, jaundice, diarrhoea, dysentery, general debility, leucorrhoea, cough, asthma, skin diseases, eye disorders etc.

**Scientific name:** *Vitex negundo* Linn.

**Family:** Verbenaceae

**Name of Drug:** Nirgundi

**Distribution:** Afghanistan, India, Pakistan, Sri Lanka, Thailand, Malaysia, eastern Africa and Madagascar

**Active ingredients:** Phenol, Dulcitol, Alkaloid-Vitricine, B-sitosterol, Camphene, a- And B- Pinenes, Angoside, Acunbin, Casticin, Artemetin, Orientin

**Parts used:** Leaf, roots and seeds

**Medicinal uses:** The drug is used as vermifuge. People used to keep leaves with pillow to dispel catarrh and headache and smoke the leaves for relief. Crushed leaf poultice is applied to cure headaches, neck gland sores, tubercular neck swellings and sinusitis. Essential oil of the leaves is also useful in treatment of venereal diseases and other syphilitic skin disorders. A leaf decoction with *Piper nigrum* is effective in catarrhal fever with heaviness of head and dull hearing. A tincture of the root-bark provides relief from irritability of bladder and rheumatism.

**Scientific name:** *Zingiber officinale* Rose.

**Family:** Zingiberaceae

**Name of Drug:** Ardrakah

**Distribution:** Cultivated in different parts of India and tropical Asia

**Active ingredients:** Zingiberene, zingerone

**Parts used:** Rhizome

**Medicinal uses:** The drug is said to be anti-rheumatic, carminative, diuretic, aphrodisiac, cooling, cordial,



digestive, acrid, hot, anodyne. Administered in colic, constipation, diarrhoea, cholera, diabetes, fever, cough, cold, dysuria, tongue and throat congestion, vomiting, cardiac disorder, anaemia, menstrual disorder and flatulence.

## 2. Conclusions

Human life is uncertain under grave situation of COVID 19 throughout the world with significant impact on the immune response involving reaction of mind and human body. We have to give emphasis focus not only on the literature of the rasayana herbs, which are proven for immunomodulatory activity, but also for non-rasayana herbs, which are equally potent immunomodulators as per ayurvedic system. Thus, existing triangle of Ayurveda, modern medicine and science has provided converging form from real discovery engine of natural resources to newer, safer, cheaper and effective therapies which is a need of the hour stating that indigenous medicinal herbs be utilized to the greatest extent. The gap that requires to be bridged is extensive screening of ayurvedic medicinal herbs for phytoconstituents that play a vital role in enhancing the immune system.

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