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## REVIEW ARTICLE ON NATURAL IMMUNE BOOSTERS

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**Abstract:** The immune system is one of nature most fascinating inventions. It is an amazing protection mechanism designed to defend us against millions of bacteria, viruses, fungi and different toxins in the nature. The immune system is very complex. It is made up of several types of cells and proteins that have different jobs to do in fighting against foreign invaders. If our immune system is working properly we are protected from dangers caused by microbes. If not, we suffer sickness and diseases. It is possible to intervene in this process and make our immune system stronger using immune boosters. Immune boosters work in many ways. They increase the number of white blood cells in the immune system army, train them to fight against microbes causing disease. This review article provides an overall view about some natural herbs like Withania Somnifera, Ocimum Sactum, Amla, Spirulina etc. All these herbs are popularly known for their immunomodulatory activities.

**Key words:** Immune boosters-substances which increase immune power, Immunomodulators-substances which changes immune activity, Invention-new findings etc.

**Introduction:** The immune system protects the body from harmful invaders and pathogenic germs. It combats pathogen-causing organisms and chemicals by going through a process known as the immune response. It is composed of a network of organs, tissues, and cells that cooperate to defend the body.

White blood cells, or leukocytes, are the relevant cells. Leukocytes are created and stored throughout the body, including the thymus, spleen, bone marrow, and lymph nodes. Through lymphatic and blood channels, leukocytes travel throughout the body between the organs and nodes. In this way, the immune system coordinates its efforts to keep an eye out for pathogens and other potentially harmful chemicals. Phagocytes are large white cells that can engulf and digest foreign invaders. They include monocytes, which circulate in the blood, and macrophages, which are found in tissues throughout the body, as well as neutrophils, that circulate in the blood but move into tissues where they are needed. Macrophages are versatile cells; that act as scavengers. They secrete a wide variety of powerful chemicals, and they play an essential role in activating T cells. Neutrophils are not only phagocytes but also granulocytes: they contain granules filled with potent chemicals. These chemicals, in addition to destroying microorganisms, play a key role in acute inflammatory reactions. Other types of granulocytes are eosinophils and basophils. Mast cells are granule-containing cells in tissue. The system of complements is made up of a number of proteins that "complement" the actions of antibodies in eradicating germs through the use of the classical and alternative complement pathways, two cascade-like pathways.

## Cytokines

The main tool of T cells, cytokines are a wide variety of powerful chemical messengers released by immune system cells. While monocytes and macrophages secrete monokines, lymphocytes, including T and B cells, secrete lymphokines. Cytokines direct cellular traffic, stimulate cell growth, support cell activation, and kill target cells, including cancer cells. Numerous cytokines are also referred to as interleukins because they act as a form of communication between white blood cells, or leukocytes. (For instance: IL-1, IL-2, etc.). Immune reaction

The body recognises and protects itself against bacteria, viruses, and other substances that seem strange and hazardous through the immunological response. A defence mechanism must first be able to identify an antigen—a foreign substance—that has entered the body. The body's antigen must be killed or eliminated as the second condition. Humoral immune response and cell-mediated immune response are the two main divisions that make up the immune system's capacity for resistance. Specific immune-system components known as antibodies are used in the humoral response, also known as the antibody-mediated response.

The first step is when particular blood cells called macrophages absorb foreign material (phagocytosis). The infectious agent is digested by the macrophages, who then expose some of its components on their surfaces. Helper-T cells are able to detect this presentation, launch an immunological response, and proliferate quickly. The activation phase is characterised by this.

The interaction between helper-T cells and B cells takes place during the subsequent phase, known as the effector phase.

Helper-T cells that are activated communicate with B cells using chemical signals, and the B cells then start to grow quickly as well. B-cell progeny either develop into plasma cells or B memory cells. Massive amounts of antibodies that will bind to the foreign invader (the antigen) are produced by the plasma cells at this point. Cell mediated immune response Macrophages or antigen presenting cells engulf antigens, process them internally, then display parts of them on their surface together with Class II MHC Molecules. This sensitizes the T cells to recognize these antigens. Helper T cells (CD4+) serve as managers, directing the immune Mucopolycaccharides, echinacocide, echinaceine, isobutylmines, linoleic and palmitic acids, essential oils, glycosides, inulin, polyacetylenes, sesquiterpenes, betaine, and phenolics are some of the recognised primary chemical components of echinacea. Additionally, echinacea contains trace amounts of iron, iodine, potassium, copper, sulphur, vitamin A, vitamin E, and vitamin C.<sup>14-16</sup> The leaves, flowers, and roots from multiple echinacea plant species are used to create medication. Echinacea is frequently used to treat illnesses, particularly upper respiratory infections and the common cold.<sup>17</sup> Some people hope to prevent a cold from developing by taking echinacea as soon as symptoms appear. Some individuals use echinacea after the onset of cold symptoms in an effort to lessen the severity of the illness.<sup>18-21</sup> Echinacea can help treat a cold, according to research so far, but having not any practical evidences. the immune system's response

One of the most potent immune boosters and stimulants is echinacea. It functions primarily in two ways. By encouraging the body to manufacture more immune cells and immunological molecules, it first strengthens the immune system.

Second, it increases the activity of these cells by igniting them. By doing these steps, you can more successfully fight off any infections or diseases while also defending against invasion and disease in the future. The immune system's "non-specific" activity is stimulated by echinacea. It raises the number of macrophages and T lymphocytes in the blood. Additionally, it raises the concentration of Interferon, Interleukin, Immunoglobulin, and other crucial naturally occurring immune chemicals in our blood.<sup>23</sup> Studies on animals and in vitro have demonstrated that echinacea appears to boost the immune system.

Plant profile:

*Withania Somnifera*:

Family : Solanaceae

Common names: Ashwagandha, Indian ginseng, Indian Winter Cherry Ashwagandha

Is an important ancient plant, the roots of which have been employed in Indian traditional systems of medicine, Ayurveda and Unani. It grows in dry parts of sub-tropical regions. It is a small, woody and erect shrub that grows up to 5 feet in height. It is well branched short shrub (35–75 cm) with a central stem from which branch extend radially in a star pattern and covered with a dense mat of wooly hairs. Leaves are alternate and ovate, up to 10 cm long and up to 5 cm wide. The flowers are small and green, while the ripe fruit is orange-red and has

milkcoagulating properties. The plant also have medicinal use.



The principle constituents of its roots, known as withanolides are believed to account for the multiple medicinal applications of ashwagandha. These molecules towards human erythrocytes which indicated immunomodulatory activity. The promotion of stem cell proliferation may be the main function of WS. It was discovered that giving Swiss albino mice WS extract dramatically reduced the leukopenia brought on by cyclophosphamide (CTX) treatment. On the 12th day, the CTX-treated group's total white blood cell count was 3720/mm<sup>3</sup>, but the CTXplus-WS group's was 6120/mm<sup>3</sup>. When compared to the CTX-alone treated group (8 x 10<sup>6</sup>/femur), the cellularity of the bone marrow was significantly higher (13.1 x 10<sup>6</sup>/femur) in the CTX-plus-WS mice (p0.001). Similar to this, the bone marrow of the CTX-plus-WS mice had more alpha-esterase positive cells (1130/4000 cells) than the CTX alone mice (687/4000 cells). These investigations showed that WS decreased the toxicity caused by CTX and might be helpful in cancer chemotherapy. More research is required.

Ocimum Sanctum:

Family:Lamiaceae

Common Name: Tulsi

It is used medicinally. It stands upright, is branched, and is aromatic. Its height is between 30 and 60 cm. Many diseases, including headache, leucoderma, asthma, bronchitis, fever, vomiting, hiccups, genitourinary disorders, ring worms, and skin diseases, as well as coughs, diarrhoea, constipation, warts, worms, influenza, the common cold, colic pain, hepatic diseases, arthritis, digestive disorders, and kidney dysfunctions, are treated with various parts of the plant. It has a wide range of pharmacological effects, including antimicrobial, anti-diabetic, anti-stress, anti-fertility, hepatoprotective, immunomodulatory, psychopharmacological, antioxidative, antipyretic, anti-carcinogenic, and antiasthmatic effects.

radioprotective action, wound-healing capacity, anticataract capacity, and antiulcerogenic capacity

Anti-inflammatory, anti-arthritic, anti-coagulant, chemopreventive, anti-analgesic, mosquito-cidal, and antilipidemic properties. It also having pharmacological activity.



Amla:

Family:Euphorbiaceae

Common Name: Indian Gooseberry,Nelli

The most significant therapeutic plant in the Indian traditional medical system, Ayurveda, is *Emblica officinalis* Gaertn. or *Phyllanthus emblica* Linn, also known as Indian gooseberry or Amla. The fruit is the most significant portion of the plant and is used to treat a number of ailments. The fruit, which is used either by itself or in conjunction with other plants, is used to treat a variety of diseases. These include treating the common cold and fever, acting as a laxative, liver tonic, refrigerant, stomachic, restorative, anti-inflammatory, and hair tonic, and as a digestive. Numerous preclinical studies have shown that *E. officinalis* has antipyretic, antitussive, adaptogenic, cardioprotective, gastroprotective, antianemic, antihypercholesterolemic, wound healing, antidiarrheal, antiatherosclerotic, hepatoprotective, nephroprotective, and neuroprotective properties. It is with immunomodulatory activity.



Spirullina:

Family: Spirulinaceae

Common Name: Spirullina

Plant part used: dry powder whole plant

The high concentration of beneficial compounds in spirulina, also known as *Arthrospira platensis*, makes it one of the most well-liked algae supplements on the market right now. Some authors have hypothesised that consuming spirulina could protect participants from the oxidative stress caused by exercise, speed recovery by reducing muscle damage, and strengthen the immune system. Due to this, the main goal of this review was to assess how spirulina affected oxidative stress, the immune system, inflammation, and performance in athletes and people undergoing exercise therapies. Out of the 428 papers that were eligible among the 981 publications found, 13 studies that met the established criteria and were included in this systematic review were chose



*Tinospora Cordifolia*:

Family: Menispermaceae

Common Name: Giloy, Guduchi, Amritvel

Plant part used: stem powder

Guduchi, also known as *Tinospora cordifolia*, is a plant with heart-shaped leaves that is indigenous to the Indian subcontinent and a member of the Menispermaceae family. *Tinospora cordifolia* stem extracts in aqueous and methanol are utilised for their immunomodulatory activity because they restore immunological imbalance, which aids in the prevention and treatment of various diseases. Due to its extensive applications in treating immune system-related disorders in traditional medicine, *Tinospora cordifolia* is currently the subject of extensive research into its immunomodulating properties. Scientific analysis is done on a number of clinical trials using TC for the treatment of viral illnesses, HIV infection, and *Salmonella typhimurium*. An efficient immune system is required in these situations to treat the illness. It has been demonstrated that *T. cordifolia* can stimulate and regulate the immune system. The current paper is an effort.



*Moringa Oleifera*:

Family: Moringaceae

Common Name: Moringa, Drumstick, Shevga

Plant part used: Leaves crude powder

A Indian-born tree known as the "miracle tree" or "tree for life" is called *Moringa oleifera*. *M. oleifera* thrives exceptionally well in tropical areas, including Benin, and is highly drought-resistant. This plant has excellent nutritional value. The many plant parts, including the leaves, fruit, seeds, roots, bark, and flowers, have a variety of therapeutic and dietary purposes in both people and animals. For instance, the leaves are a good source of vitamins, phenolic compounds such as phenolic acids, tannins, flavonoids, phytosterols, and alkaloids as well as minerals and other nutrients. Anaphylactic, ulcer-fighting, hepatoprotective, anti-inflammatory, antitumor and anticancer, antioxidant, antidiabetic, and antibacterial properties of *M. oleifera* are said to exist. The objective of the current study is to determine whether *Moringa* can be used to treat different immunological diseases.



### Conclusion:

All body tissues intelligently communicate with one another in order for the immune system to operate. Many common diseases are brought on by or advance as a result of changes in the immune system's delicate balance. Natural components will aid in delivering the body's ideal immune function and regulating unwelcome inflammatory reactions. A combination of natural herbs that have been well studied and are known to support and stimulate the immune system, fight infections, aid in the healing of wounds brought on by infections, and manage other disorders that create the groundwork for disease make up Nature's Immune Stimulator. The five herbs Echinacea purpurea, Panax ginseng, Astragalus membranaceus, Uncaria tomentosa, and Withania somnifera that were previously described all contain different chemical components that boost the immune system in a variety of ways, including the following:

Boosts the immunological system.

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