

HERBAL PLANTS AS IMMUNOMODULATORS

Shweta Jain

Assistant Professor, Veterinary Polytechnic, Rajnandgaon,
DSVCKV, Durg (C.G.)

Ayurveda is the earliest medicinal system developed in India and describes an enormous range of herbal and mineral medicines. Three hundred years ago, herbal therapy was recognized as holistic healing practice to counter physical ailments in Asia. An entire section of the Materia Medica of Ayurveda is devoted to “Rasayana”, drugs reputed to enhance body resistance. Presently, the power of herbal therapy is being admired globally, and a wide array of studies and their results justifies their successful impact in various treatments.

A strong, well-functioning immune system is the cornerstone of good health. Immunity is the balanced state of having adequate biological defenses to fight infection, disease, or other unwanted biological invasion while having tolerance to avoid allergy and autoimmune diseases. In present scenario of Covid 19 pandemic, enough strong immunity is needed for its prevention or survival in such conditions. Ayurveda provides ways for evolving physiological responses to built immunity. Multiple actions of herbal preparations are claimed to have a lower risk of drug resistance, in addition to being more environmental friendly, compared to modern medicines. Herbal preparations constitute a large section of ethnoveterinary medicines and many of them are used to boost the immune status of domestic animals. In addition to their immunoregulatory activities, natural products have various beneficial effects, including antipyretic, antioxidant, anti-inflammatory, antiulcer, antidiabetic, cytoprotective and anticancer etc.

IMMUNOMODULATORS

Immunomodulators are the substances which cause any changes in the immune response and may involve induction, expression, amplification or inhibition of any part or phase in the immune response.

Clinically, immunomodulators have three categories:

Immunostimulants are inherently non-specific and enhances body's resistance to infection. In healthy individuals, the immunostimulants enhances the basic level of immune response. In individual with impaired immune response they are expected to act as immunotherapeutic agents.

Immunosuppressants suppress immune response and are often used in combination regimens to treat various types of organ transplantation and autoimmune diseases.

Immuno-adjuvants are used to enhance the efficacy of vaccines and therefore could be considered specific immune stimulants.

Many infectious diseases and disorders arise because of stressful environmental conditions associated with suppression of immune system. Plants are the biosynthetic laboratory of phytochemicals. Phytochemicals are naturally occurring compound with bioactive potentials. These chemicals are often referred to as “secondary metabolites”. These are several classes of compounds that include Alkaloids, Phenolic compounds, Glycosides, Flavonoids, Terpenoids, saponins, polysachharides, sterols, tannins etc. and have immunomodulatory activity.



Alkaloid	: Piperine (<i>Piper longum</i>), Quinine (<i>Cinchona spp.</i>)
Glycosides	: Mangiferin (<i>Mangifera indica</i>), Eupalitin (<i>Boerhaavia diffusa</i>), Picroliv (<i>Picrorhiza scrophulariiflora</i>), Anthraquinone (<i>Andrographis paniculata</i>)
Phenolic compounds	: Gallic acid (<i>Camelia sinensis</i>), Curcumin (<i>Curcuma longa</i>), Gingerol (<i>Zingiber officinale</i>), Ellagic acid (<i>Punica granatum</i>)
Flavonoids	: Quercetin (<i>Emblia officinalis</i>), Luteolin (<i>Plantago major</i>), Kaempferol (<i>Urtica dioica</i> , tomato, cruciferous vegetables, apple)
Saponins	: Asiaticoside (<i>Centella asiatica</i>), Glycyrrhizin (<i>Glycyrrhiza glabra</i>)
Tannins	: Chebulagic acid and Corilagin (<i>Terminalia chebula</i>)
Terpenoids	: Andrographolide (<i>Andrographis paniculata</i>), Boswellic acid (<i>Bowella serrata</i>), Ursolic acid (<i>Ocimum Spp.</i>)
Sterols	: Withanolide (<i>Withania somnifera</i>), β -Sitosterol

Medicinal plants capable of inhibiting the cellular and humoral responses could have useful applications in the treatment of immunological disorders.

Various plants with immunomodulatory activity are:

- *Withania somnifera* (Ashwagandha)
- *Tinospora cordifolia* (Giloy)
- *Ocimum spp* (Tulsi)
- *Curcuma longa* (Haldi)
- *Zingiber officinale* (Ginger)
- *Allium sativum* (Garlic, Lasun)
- *Cinamomum* (Dalchini)
- *Aloe vera* (Ghrita kumari)
- *Phyllanthus emblica* (*Emblia officinalis*, Amla)
- *Glycyrrhiza glabra* (Mulethi, Licorice or Sweetwoods)

• *Azadirachta indica* (Neem)

Various plant extracts and their preparation in specific dose simultaneously during the scheduled vaccination regimen may be helpful to enhance immunity. In animals environmental stresses like heat stress is common resulting into immune compromised status which reduces the growth and production. Supplementation of dietary immunomodulatory agents, may be helpful in potentiation of growth and production, among which herbal preparations can have a significant place. Ashwagandha, Giloy, Dalchini, Aloe vera, Tulsi, Amla, Haldi, Ginger, Garlic and their formulation may be recommended as promising immunomodulating agents.