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A REVIEW ON IMMUNOMODULATORY NATURAL PLANT

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ABSTRACT

A tremendous increase the knowledge of natural herbal drug and their usages in recent year sum naturally occuring plants affect in the immune system they can achived by the immunomodulatory agent form the natural source. In which many low molecular weight compound and high molecular weight compound. Herbal medicine constitute is a major role in all tradisnal and alternative medicinal system like Ayurveda Siddha Naturapathy and Homeopathy. The present review summarise some of Indian medicinal plant with immunomodulatory action and also useful to future research in this area.

KEYWORDS: Immunomodulation, medicinal plant, Immune system.

INTRODUCTION

The concept of immunomodulation was derived by Edward Jenner discovery of Small Pox Vaccine in 1796 that attenuated infectious agent can boost human immune system to fight against subsequent infection with same or closely related infection agent. In chronic stress, illness, environmental and life style changes adversely affect the immune System. Plant and other natural product have use ages for health and maintenance of life. Certain natural and synthetic compound that can modulate immune responses in a positive or negative manner are Known as “Immunomodulators”. Bases on their effect on immune system their agent are categorized as a Suppressor or Stimulant or Adjuvant. In autoimmune disorder, a hyperactive immune system fail to recognize self from non self and lead to destruction of self- entities. Here immunosuppressor play a pivotal role in suppressing the immune system to restore normalcy. Immunostimulator are used to replenish deficiency in immune system as observed in treatment of disease like AIDS. Human live in world that is heavily polluted by much toxic or allergenic substance that threatan normal bodies. The immune system known as

sophisticated network is not only responsible for protecting the body against disease and foreign material but also protect host from toxic and allergenic substance that enter body. The immune system is important physiological system that regulates homeostasis of body in vertebrates. Immunization may active or passive. Active immunization involved stimulation with an antigen to develop immunological defenses against a future exposure. Passive immunization involve administration of preformed antibody to an individual who is already exposed or is about to be exposed to an antigen.

Plant as immunomodulatory: Herbal Medicine is generally considered a well establish from complementary medicine and studies show that majority of world population, especially, in developing countries, still use traditional plant medicine for their primary healthcare. Ayurveda the traditional Indian system of medicine has suggested mean to increase the body natural resistance to disease by using plant based polyherbal formulation.

Plant derived immunomodulator: Since ages, Plants have been used for the prevention and cure of various ailments including microbial and lifestyle disease (Kalia 2011). According to World Health Organization (WHO), approximately. Three quarter of world population relies on herbal medicine. Phytoimmunomodulatory agent can increases the body immune responsiveness against pathogens by activating the immune system in a specific or nonspecific manner that includes both the innate and adaptive immune system. Immunomodulatory plant play a pivotal role in treatment of infection, inflammation and in immunodeficiencies by effect on various cell type via cytokines and interleukins. The mode of action in immunostimulator, immunosuppressor or immunoadjuvant to boost antigen-species immune response. Plant product are widely considered as immunopotentiator and collectively known as biological response modifiers (BRMs). The current practice of prescribing photochemical to support the immune system or to fight infections is based on centuries old traditions. The last factor is very important, since high doses tend to be immunosuppressive and low doses of the same tend to become immunostimulatory. Finally it should be noted that most in-vitro or in-vivo models are not adequate or not simple enough to ensure that the same can be used as a drug.

Properties of immunomodulators: Immunomodulator are not true antigen but are mitogens or antigenomimetics (mimics the action of real antigens). Antigenomimetics require booster does for efficient functioning like drug for efficacy functioning. Like drug metabolism in body. The efficacy of immunomodulators is dependent on various factors like dosage, time,

mode and duration of administration, as well on immune responsiveness of system. The immune system is composed of many interdependent cell types that collectively protect the body from bacterial, parasitic, fungal, viral infections and from the growth of tumor cells. Many of these cell types have specialized functions. The cells of the immune system can engulf bacteria, kill parasites or tumors cells, or kill viral infected cells. Often, these cells depend on the T helper subset for activation signals in the form of secretions formally known as cytokines, lymphokines, or more specifically interleukins.

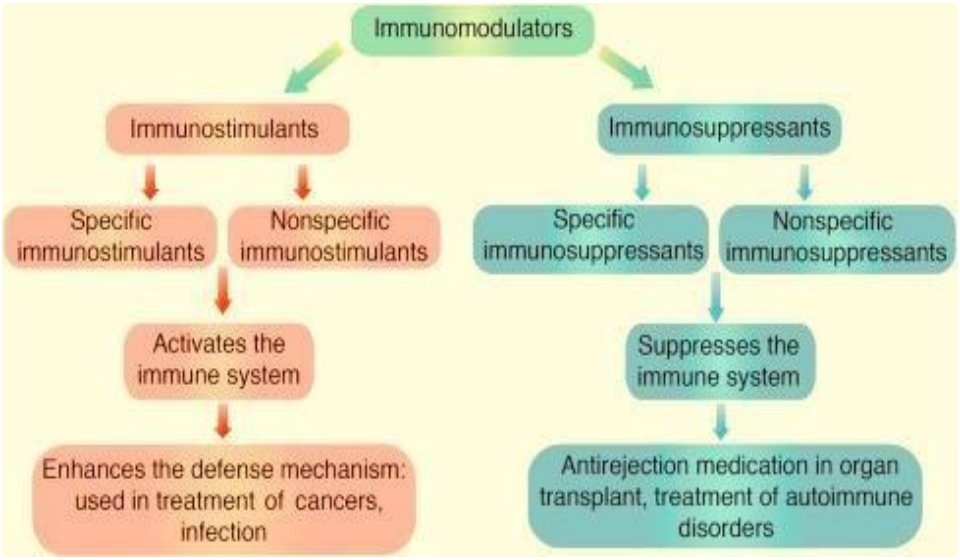

Fig. 1. immunomodulator type.

Disorder of human immunity:– Failures of host defense do occur, however, and fall into three broad categories: immunodeficiencies, autoimmunity, and hypersensitivities**.**

Immunodeficiency:– Immunodeficiencies occur when one or more of the components of the immune system are inactive. However, malnutrition is the most common cause of immunodeficiency in developing countries. Diets lacking sufficient protein are associated with impaired cell mediated immunity, complement activity, phagocyte function, I A antibody concentrations, and cytokine production. Deficiency of single nutrients such as zinc; selenium; iron; copper; vitamins A, C, E, and B6; and folic acid (vitamin B9) also reduces immune responses.

Autoimmunity:- Autoimmune disease arises when the body mounts an immune response against itself due to failure to distinguish self tissues and cells from foreign antigens. Examples of such diseases include rheumatoid arthritis.

Hypersensitivity:– Hypersensitivity occurs in two phases: the sensitization phase and the effectors phase. Sensitization occurs upon initial encounter with an antigen; the effectors phase involves immunologic memory and results in tissue pathology upon a subsequent encounter with that antigen.

Immunomodulation therapy: The development agent is important to immune response .become on important area of pharmacology. The rational underlying this approach is that such drug many increase immune responsiveness of patient who have either selective or generalized immunodeficiency. The major potential all uses are in immunodeficiency disorder, chronic infection disease and cancer.

Screening Protocol for Immunomodulatory constituent from Plants: In order to isolate the active phytoconstituents, the plant extract are subject to chromatography separation using thin- layer chromatography (TLC). Separation by various processes like sequential fractionation using column chromatography and each isolated fraction is further validated for it Immunomodulatory action, a process known as bioactivity-guided fractionation by various In-vitro and In-vivo assay followed by pharmarocological testing on animal model to evaluated its efficacy and toxicity. In vitro method are devised for pharmacological screening of medicinal plant that involved high throughput screening of a large number of putative medicinal plant. As it give some insight into possible mode of action. Validation of in vitro result results should performed in animal (In vivo) models. Multiple In vitro assays are required to validation various parameter of efficacy of a compound to be used as immunomodulators. The commonly used animal model for infection and immunosuppressant, and ability of active phytoconstituents to reverse or antagonize the mild, moderate or severe infection or to enable recovery is assessed in an immunosuppressed system.

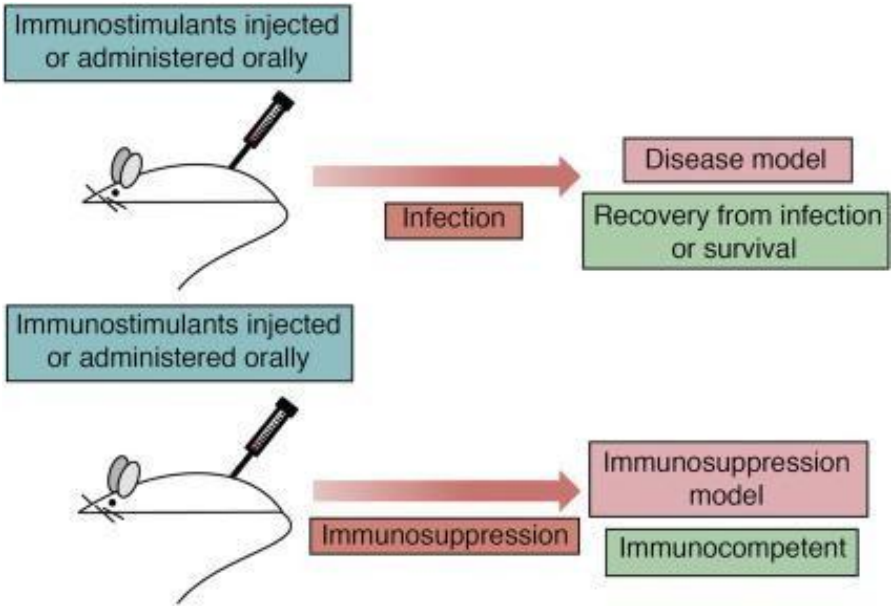

Fig. 2. Screening Protocol for Immunomodulatory.

Table 1: Common immunomodulatory plant.

Botanical name	Family	Ayurvedic common name	Part used
Odium sanctum Linn.	Labiate	Tulsai	Entire plant
Morus alba Linn.	Moraceae	Brahmdaru	Fruit.Leaves.bark
Panax ginsing wall	Araliaceae	Ninjin	Fruit.root
Achilles millefolium	Compositae	Yarrow	Leaves
Aloe vera tourn ex Linn.	Liliaceae	Kumaari	Gel form leaves
Andrographic panicuata nees .	Acanthaceae	Kalmegha	Leaves
Asparagus racemous wild	Liliaceae	Shatavari	Root
Mittha koenigi (L) Sperng	Rutaceae	Surbininimba	Leaves
Tinospora cardifolia miers	Menispermiaceae	Amrita	Entire herb
Logenaria siceraiamol.	Cucurbitaceae	Kauttumbi	Leaves fruits
Terminals arnuna Roxb.	Combretaceae	Arjuna	Leaves bark
Bauhinia variyata Linn.	Caesalpinaceae	Kaanchana	Root bark bud
Urena lobata Linn.	Malvaceae	Naagabala	Root flower
Gymnema Sylvester RBR	Asclepiadaceae	Gurmaar	Leaves
Cordiasuperb cham	Boraginaceae	Shleshmaataka	Leaf fruit bark
Picrorhiza scrophulariifora bench.	Scrophulariace	Kutki	Root
Heracleum persicumoesf	Apiaceae	Golpar	Shrub
Cissampelose pariena Linn.	Menispermiaceae	Paatha	Roots
Abutilon indium Linn.	Malvaceae	Atibalaa	Whole pant
Chlorophytum borivilianum santf	Liliaceae	Safed muslin	Roots

Botanical name	Family	Ayurvedic comman name	Part used
Alternanthera tenella colla	Amaranthaceae	Snow ball	Herb
Ganoderma lucidum.p.karst	Polyporaceae	Reishi mushroom	Whole plant
Nyctanthes Arbor - tristis L.	Oleaceae	Paarijaata	Leaf seed
Actinidia macrosperma. c. f. Liang	Actinidiaceae	Actinidia	Fruits
Acacia catechu willd	Leguminaceae	Khadria	Leaf
Boswellia sapp.	Burseraceae	Shallaki	Gum resin
Hibisus Rosa sinesis Linn.	Malvaceae	Japaa	Flower
Cleome gynandra Linn	Capperdiceae	Tilaparni	Leaf seed root
Hyptis saveolens	Lamaceae	Tumbaaka	Leaf flower
Danica dumetorum Lamk	Rubiceae	Madana	Fruits
Allium hirtifolium boys	Alliaceae	Prassin shallot	Herb
Citrus natsudaida hyata	Rutaceae	Japanese summer grape fruit	Fruits
Acantnopanax sessiliflorus	Araliaceae	Prickly spine	Shoot roots
Agelas mauritianus	Porifera	Agelas	Sponge
Apium graveolens Linn.	Apiaceae	Celery seed	Leaves seed
Genus ardisia	Myrisinaceae	Malberry	Shuru leaves
Genus aristolochia	Aristolochiaceae	Papavine	Leaves
Artimisia annua Linn.	Compositea	Warm wood	Herb
Genus Aspergillus	Trichocomaceae	Aspergillus	Fungus

Botanical name	Family	Ayurvedic commonname	Part used
Boerhaavia diffusa	Nyctaginaceae	Punarnava	Herb
Camella	Theaceae	Tea	Leaves
Cannabis sativa	Cannabeaceae	Cammon hemp	Leaves
Centella asiatica Linn.	Umbelliferae	Bramhi	Herb
Cistanache desericola	Orobanchanaceae	Cistanche	Herb
Echinacea angustifolia	Asteraceae	Cone flower	Flower
Eclipta albal	Compositae	Bringraja	Leaves
Matricaria chamomilla	Rhabdovridace	Chamomile	Flower
Moringa oleiferal	Molluginaceae	Sahijan	Leaves
Piper longum L.	Piperaceae	Pipali	Fruits
Salicornia herbacea	Chenopodiaceae	Glasswort	Herb

CONCLUSION

Immunomodulatory plant are the agent that alter the immune system. If increase the immune response called as immunostimulant and decrease the immune system called as immunosuppressant. These drug are mostly used in autoimmune disease condition like AIDS, Covid- 19(corona virus) allergic reaction, viral infection. In India only a few plant are screens for immunomodulatory action form the above review. It is a evident that are several natural medicinal plant which have immunomodulatory action but inadequate evident does not allow clincal practice. Because of this immunomodulatory collective plant information will more important in the future research of herbal medicine.

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