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review Article

Review article on Immunomodulatory Activity of the Ayurvedic Formulation

Yamini patel[1*], Hiral Dave[1]

[1]*Department of pharmaceutics, Rofel, Shri G.M .bilakhia college of pharmacy, Valsad, Gujarat, India*

ABSTRACT

An immunomodulator can be defined as a substance, which can influence any constituent or function of the immune system in a specific or nonspecific manner including both innate and adaptive arms of the immune response. Immunomodulatory activity was evaluated for Ayurvedic herbal formulation. Immuno modulation is the alteration of immune response which may increase or decrease the immune responsiveness. The present review summarizes marine and some of Indian medicinal plants with immunomodulation action and also to provide insights into the future research in this area.

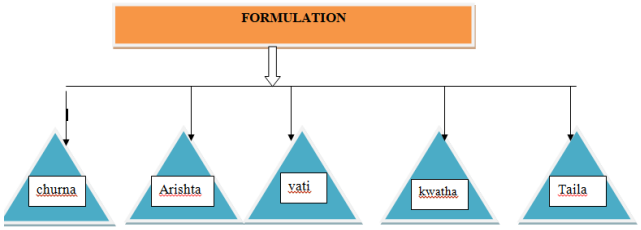
Keywords: Ayurvedic Formulation, Immunity, Immunomodulator , Immune Response, Testing Immunological Factors, Plant-Derived Immunomodulator.

INTRODUCTION

Ayurvedic formulations are available in capsules, tablets, tonic and supplements possesses immune-boosting properties which can be taken to promote overall health and well-being. Traditional medicine all over the world is currently being revalued through extensive research activity on various plant species and their therapeutic properties. Many polysaccharides isolated from higher plants are considered to be biological response modifier and enhance various immune responses, like complement activation, proliferation of lymphocytes and stimulation of macrophages. Plant flavonoids also used as immunostimulator, which is important for growth, development and immunity. 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 [15]

DIFFERENT FORMULATIONS AVAILABLE IN AYURVEDIC

Ayurvedic medicinal formulations are available in different forms of powder, pills, liquid and semisolid etc. These are classified under following categories.



CHURNA

Churna (Sanskrit: चूर्ण "powder") is a mixture of powdered herbs and or minerals used in Ayurvedicmedicine. Churna is defined as a fine powder of drug or drugs in Ayurvedic system of medicine. Drugs mentioned in patha, are cleaned properly, dried thoroughly, pulverized and then sieved. The churna is free flowing and retains its potency for one year, if preserved in an airtight containers.

Corresponding to: Patel Y, Department of pharmaceutics, ROFEL, SHRI G.M.BILAKHIA COLLEGE OF PHARMACY, Valsad, Gujarat, India; E-mail: yami79277@gmail.com

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KWATHA

In Ayurveda, the decoction is also called Kwatha, Kashayam and Shrita etc. A decoction is herbal liquid preparation made from 1 part of herbs in 16 parts of water, which is reduced to 1/8th part of liquid after boiling on a low flame. This remaining liquid is known as Kwatha.

ARISHTA

Ayurvedic formulations that are prepared by soaking the herbs either in the powdered form which is Churna or liquid form which is Kwatha in a solution containing jiggery or sugar. This process of fermentation helps in extraction of active ingredients of herbs.

VATI

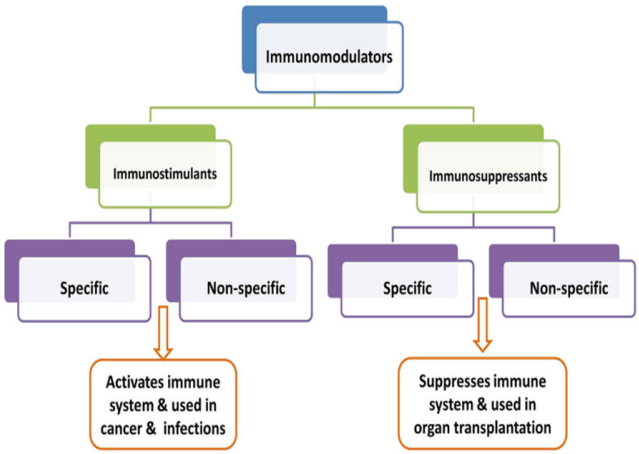
These are Ayurvedic pills or tablets. These are prepared from various herbs or minerals in the form of tablets. They help you in getting rid of the various health problems. It is very widely used dosage form.

IMMUNITY

This may be defined as the body's ability to identify and resist large numbers of infectious and potentially harmful microorganisms, enabling the body to prevent or resist diseases and inhibit organ and tissue damage. The immune system is not confined to any one part of the body. Immune stem cells, formed in the bone marrow, may remain in the bone marrow until maturation or migrate to different body sites for maturation. Subsequently, most immune cells circulate throughout the body, exerting specific effects. The immune system has two distinct but overlapping mechanisms with which to fight invading organisms, the antibody-mediated defense system (hum oral immunity) and the cell-mediated defense system (cellular immunity).

Immunomodulator These are biological or synthetic substances that can stimulate, suppress or modulate any aspect of the immune system including both adaptive and innate arms of the immune system.

CLASSIFICATION OF IMMUNOMODULATOR



Drugs that modify the Immune response

Immunomodulatory drugs are Disease Modifying Drugs (DMDs). These are mainly classified into two groups.

IMMUNOSTIMULANTS

- Synthetic compounds
- E.g. Isonosine, Levamisole.
- Immune globulin
- Cytokines E.g. interferon (INF-α), Interleukins (IL-2)
- Peptides E.g. dialyzable leukocyte extracts, neuropeptides, thymic factors.
- Microorganisms

IMMUNOSUPPRESSANT

- Specific T- cell inhibitors (calcineurin inhibitors) E.g. cyclosporine, tacrolimus
- Cytotoxic drugs (Antiproliferative drugs) E.g. Azathioprine, Cyclophosphamide, methotraxate, chlorambucil, mycophenolatemofetil.
- Glucocortcoids E.g. Prednisolone and others.
- Antibodies. E.g. Muromonal CD3, antithymocyteglobulin, Rho (D) immunoglobulin

METHODS FOR TESTING IMMUNOLOGICAL FACTORS

In vitro methods

- Inhibition of histamine release from mast cells
- Mitogens induced lymphocyte proliferation
- Inhibition of T cell proliferation
- Chemiluminescence in macrophages
- PFC (plaque forming colony) test in vitro
- Inhibition of dihydro-orotate dehydrogenase

In vivo methods

- Spontaneous autoimmune diseases in animals
- Acute systemic anaphylaxis in rats
- Anti-anaphylactic activity (Schultz-Dale reaction)

- Passive coetaneous anaphylaxis
- Arthus type immediate hypersensitivity
- Delayed type hypersensitivity
- Reversed passive arthus reaction
- Adjuvant arthritis in rats
- Collagen type II induced arthritis in rats
- Proteoglycan-induced progressive polyarthritis in mice
- Experimental autoimmune thyroiditis

A Brief Description Common Plant Derived Immunomodulator

Sr. no	Botanical (family)	Ayurvedic/ common name	Part used	Chemical constituents	Other biological activities
1.	Ocimum sanctum Linn	Tulasi	Entire plant	Essential oil such as euginol,carvacrol,derivatives of urosolic acid, apigenin flavonoids, anthocyanins	Carminative, stomachic, antispasmodic, antiasthma tic.
2.	Morus alba Linn.	Brahmda-ru	Fruits, leaves, bark	Flavonoids, anthocyanins	Expectorant, hypocholesterolaemic, diuretic
3.	Panax ginseng wall	Ninjin	Fruits, root	Saponins such as ginsenosides, panaxdiol, oleanolic acid	Adaptogenic propwerties, antiarrhythmic
4.	Achillea mille folium c.koch	yarrow	leaves	Flavonoids, alkaloids, polyacetylenes	Anti-inflammatory, antispasmodic, antipyretic, diuretic
5.	Aloe Vera tourney Linn.	kumaari	Gel from leaves	Anthraquinone glycosides	Purgative, emmenagogue, ant inflammatory
6.	Andographis paniculata needs	kaalmegha	leaves	dlterpenes	Hepatoprotective, antispasmodic, blood purified
7.	Asparagus racemosus wild	shatavri	roots	Saponins, sitosterol	Ulcer healing agent, nerving tonic, ant gout
8.	Murraya koenigli spreng	Surabhini-nimba	leaves	Coumarin, carbazole alkaloids, glucoside	Antifungal, insecticidal
9.	Couroupita guianensis aubl.	nagalinga	Fruits, flower	Steroids, flavonoids	antifungal
10.	Tinospora Cord folia miers	Amrita, guduuchii	Entire herb	Alkaloid constituents such as a berberine ,tinosporic acid	antipyretic
11.	Lagenaria siceraria mol.	Katu-tumbi	Leaves, fruit	Cucurbitacin, beta-glycosidase	Purgative, emetic
12.	Terminalia arjuna roxb.	arjuna	Leaves, bark	Flavonoids, oligomeric	Cardio tonic, diuretic
13.	Bauhiniav-ariegata Linn.	kaanchana	Roots, bark, buds	Flavonoids, beta-sitosterol	Antifungal, astringent
14.	Urenaloba-ta Linn.	naagabala	Roots, flowers	flavonoids	Diuretic, emollient, antispasmodic
15.	Gymnema sylvestre R.Br.	Gurmaar	leaves	sapogenins	Ant diabetic, diuretic, antibilious
16.	Cardia superb Cham	shleshmataka	Leaf, fruit ,bark	Alpha-amyrin	Anti-inflammatory, antimicrobial

17.	Picrorhiza scrophulariiflora benth	kutki	roots	Iridoid glycosides ,amphicoside	antioxidant
18.	Heracleum persicum desf	Golpar	shurb	flavonoids	antimicrobial
19.	Cissampelos pareira Linn.	patha	roots	Hhayatine alkaloids	Antipyretic, analgesic
20.	Abutilon indicum Linn.	atibalaa	Whole plant	flavonoids	Diuretic, antibacterial
21.	Chlorophytum borivilianum sant.F	Safed musli	Roots	sapogenins	antifungal
22.	Alternanthera tenella colla	Snow ball	herb	Flavonoids, triterpenes	Anti-inflammatory

RESULTS AND DISCUSSION

In Ayurvedic immunology is interlinked with tissue nourishment and Ojas formation is the biological determinant of vital strength and immune strength of an individual. Different Ayurvedic formulations like Kwatha, Tailaa and Vati etc. are available in the market for the easy therapeutic usage. Some examples of immune-booster Kwatha and Vati are Haridra Kwatha, Shirishadi Kwatha, Giloy Ghan Vati and Sudarshan Vati, etc. Immunomodulatory drugs are agents that could alter immune system of an organism, if it increases the immune response are called as immunostimulants or if it decreases immune response are called as immunosuppressants. Therefore Immunomodulatory agents will gain more importance in the future research of herbal medicine.

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