Review Article

IMMUNOSTIMULANT ACTIVITY OF POLYHERBAL DRUGS AND ITS INDIVIDUAL PHYTOCONSTITUENTS

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ABSTRACT

The present review investigation was focussed on past and present scenario to access the latest development regarding immunostimulant activity of herbal based, hence it has less side effects when compared to the allopathic medicine. Immunostimulants are used to stimulate or potentiate the weapons of your immune system with this balancing effect. The component of immune system including both innate and adaptive immune responses. There are abundant medicinal plants and its individual phytoconstituents have a major role to play in curing certain immune diseases causing body against infections without producing any adverse effects. The aqueous plant extract of polyhedral drugs have been possible for immunostimulant properties. Some of the traditionally Indian medicinal plants are *Acorus calamus, Alpinia officinarum, Azadirachta indica, Glycyrriza glabra, Hedyotis corymbosa, Justica adhatoda, Piper longum, Rosa foetida and Zingiber officinalis*. This polyhedral drugs being used as immunostimulant, antibacterial, antifungal, anti-inflammatory and antioxidant activity. This polyhedral drugs was subjected to preliminary phytochemical screening of the extracts presence of alkaloids, glycosides, flavonoids, saponins, tannins, terpenoids and phenolic content. Antibacterial activity against E.Coli, S.Aureous, antifungal activity against A.Fumigatus, C.Albicans.

Keywords: Immunostimulant activity, Polyherbal, Antibacterial, Antifungal, Anti-inflammatory, Antioxidant.

INTRODUCTION

Immunostimulants are also known as immunostimulators are substances (Drugs , nutrients and immune system components) that stimulate the immune system by inducing activities and increasing activity of any Non-specific Immunostimulants of its components and need to be considered in order to regulate the normal immunological functions. Immunostimulants are integrally non-specific in nature. They are used in disorders includes immunodeficiency diseases, Cancer, Viral, bacterial, Fungal and certain auto-immune disorders. Based on its action there are two types of immunostimulants they are;

- Specific Immunostimulants
- Non Specific Immunostimulants

Specific Immunostimulants

It provides antigenic specificity in immune response substances vaccination.
Example: Vaccine

Non-specific Immunostimulants

Those act irrespective of antigenic specificity so act against all antigen
Example: Immunoglobulin's
In literature survey many herbal plants used in traditional medicines evident having immunostimulant activity by using modern scientific methodologies. Because they are easily available and are cheaper but an important reason has been safer than synthetic drugs which may not always be true.

Mechanism of Immunostimulants

Immunostimulants are the drugs which may stimulate immune mechanism by either suppressing or by stimulating one or more following process.

- Antigen recognition and phagocytosis
- Lymphocyte proliferation and differentiation
- Synthesis of antibodies
- Ag – Ab interaction
- Release of mediators due to immune response
- Modification of target tissue response

Plants with Immunostimulant activity

The following common traditional Indian medicinal plants are used in immunostimulant activity;

1. *Acorus calamus* (Acoraceae) - Root
2. *Adhatoda vasica* *(Acanthaceae)* - *Leaf*
3. *Alpinia officinarum* (Zingiberaceae) - Root
4. *Azadirachta indica* (Meliaceae) - Leaf
5. *Andrographis paniculata* (Menispermaceae) - Leaf
6. *Glycyrrhiza glabra* (Leguminosae) - Root
7. *Hedyotis corymbosa* (Rupiaceae) - Root
8. *Piper longum* (Piperaceae) - Dried Fruit
9. *Rosa foetida* (Roseaceae) - Flower
10. *Tinospora cordifolia* (Menispermaceae) - Leaf
11. *Withania somnifera* (Solanaceae) - Leaf
12. *Zingiber officinalis* (Zingiberaceae) - Dried Rhizome

These drugs are known to possess the immunostimulant activity. So the immune system plays an important role in biological adaptation. The fresh extraction was prepared in this laboratory tested for the presence of above mentioned parameters they are:

- Physicochemical properties
- Phytochemical screening test
- Anti-bacterial activity
- Anti-Fungal activity
- Anti-Inflammatory Studies
- Anti-Oxidant studies
- Cytotoxic studies

***Acorus calamus* (Sweet flag)**

Acorus calamus are found in all over the world. It is considered to be a towering plants, aromatic comes under the family Acoraceae. It contains not less 1.5 to 3.5% of volatile oil and bitter amorphous. In traditional systems of medicine Acorus Calamus are said to be a chief drug especially in treating of the Nervous system. It also increases blood supply to brain and oxygenates it. Plant parts such as leaves, roots, stems, used in the treatment of Antifungal, antibacterial, anti-inflammatory, antioxidant, immunomodulatory, anticonvulsant, antispasmodic, ant diabetic, anticancer activity. By means of indigenous systems of medicine sweet flag is given for children for proper functioning of Brain. Sweet flag contains asaraldehyde, asarone, ß-asarone and eugenol. Acorus calamus includes four cytotypes: diploid, triploid, tetraploid and hexaploid.

***Alpinia officinarum* (Galangal)**

It is also known as lesser galangal, is a plant in the ginger family, cultivated in South Asia. It can grow 1.5 to 2m high, with long leaves and reddish-white flowers. The rhizomes known as galangal are sweet spicy flavour and aromatic scent. In Tamil it is known seetharathai, widely used in siddha medicines. It contains high concentrations of the flavonol galangin, ß-sitosterol, Emodin & Quercetin. Historically, the rhizomes are used to stimulant and digestive effects and also used to stomach ache, treating cold, anti-diabetic, antioxidant and anti-emetic, antiplatelet. In Asia the rhizomes are grind to powder for use in curries and drinks. In India an extract is used in perfumes and prepare a tea with it. It has also been used against fungal disease and jellies.

***Andrographis paniculata* (Green chiretta)**

It is the one of the highly used potential medicinal plants in the world. This plant is both Ayurveda and traditional Chinese medicine in India, China and Southeast Asia belongs to the family acanthaceae. It is commonly known as king of bitters or kalmegh. Its leaves and stems are used for medicinal purposes. This plant is a major ingredient of the polyherbal formulation by the name nilavembu kudineer chooranam in siddha medicine. It has been used to anti-diarrhoea, treatment of upper respiratory tract infections and anti-inflammatory, anti-bacterial, anti-viral, hepatoprotective. It contains diterpene lactones & flavones, andrographolide. The leaves contains the maximum active constituents while in the stem is in lesser amount.

***Azadirachta indica* (Neem tree)**
It is commonly known as neem, nimtree and Indian lilac, has attracted worldwide in recent years, to its wide range of medicinal properties. Comes under the family meliaceae. It has been extensively used in Ayurveda, unani and homeopathic medicines. The medicinal utilities have been described especially for neem leaf. It consists of the fresh or dried leaves and seed oil of *Azadirachta Indica*. The tree is native to India, Nepal, Bangladesh and Pakistan, also found in Malaysia and China. It has been used to anti-inflammmatory, analgesic, antipyretic activities, immunostimulant, hypoglycaemic, antimalarial, antifungal, antibacterial, antiviral, antioxidant, anticarcinogenic activity, antiulcer, antifertility effect. It contains Azadirachtin, Nimbin, Nimbidin, Nimbidol, Sodium nimbinate, Gedumin, Quercetin.

***Glycyrrhiza glabra* (Liquorice)**
It is one of the pharmaceutically important plants of India also known as liquorice belongs to the family leguminosea. It is the dried, peeled or unpeeled, roots, rhizome of *Glycyrrhizea Glabra*. Its edible root which is widely used in medicine and as flavouring. It is in long, straight, nearly cylindrical shape, taste sweet, very slightly acrid. It is also used as an Expectorant, Demulcent, Flavouring agent, Anti-inflammatory, Rheumatoid arthritis, Peptic ulcer, Antispasmodic. It contains Glyeyrrhizin, Glycyrrhizic acid, Glycyrrhitic acid, Glucoronic acid, Liquiritin, Sugars, Resin, Starch**.**

***Hedyotis corymbosa* (Diamond flower)**
Hedyotis corymbosa is considered a weed of the Rubiaceae family it grows in both dry and wet lands, and also commonly known as 'Parppatakapullu' in traditional medicine of Kerala, annual grows up to 40cm in height, leaves are simple and opposite, narrow with recurved margins, flowers white in pairs or in clusters of three, fruits are capsules. It is used as Anthelmintic, Flautulence, Diarrhea, Dysentery and Constipation. It contains Geniposide, Scandoside, Asperulosidic acid, Asperuloside, Flavonoid glycosides, Galactose, Glucose, Coumaric acid.

***Justica adhatoda* (Vasica)**
Vasica is an important medicinal plant in our community, belongs to the family acanthaceae, it is also known as vasaka. It is a native plant of Asia which is widely used in Ayurveda, Homeopathy and Unani system of medicine.
It is shrub grows crowded along waste land, roadsides etc. leaves are simple, opposite, ovate-lanceolate, acute and shiny. Flowers are white in capsule shape. Leaves of dark green colour above and pale yellow below. It is used as Alternative, Antispsmodic, Diuretic and Expectorant. It contains Quinazoline alkaloid, Vasicine, Vasicol, Adhatodinine & Vasicinol.

***Piper longum* (Pippali)**
Long pepper is a spice also known as pippali belongs to the family Piperaceae. Long pepper is an important and common ingredient in many medicines of Ayurveda. It can be used in many different ways like as a spice, as a home remedy, as catalyst that can increase the effectiveness of other herbs or as a medical herb. Long pepper is a powerful herb to stimulate respiratory and digestive system. Long pepper is a metabolic stimulate. Long pepper can also regulate the production of insulin. It is used as Antioxidant, Antispasmodic and Cytotoxic. It contains Alkaloids contain Piperine, Piperlongumine, Piperlonguminine.

Rose foetida
Rose is a woody perennial flowering plant. Roses are also used in herbal and folk medicine. Rose perfumes are made from after of roses or rose oil. Rose water, made as a by-product of rose oil production. Day temperature of 25^{o}C and a right temperature of 10^{o}C, are good for high quality roses. Roses require loamy, well-drained soil. It has been used for the preparation of Perfumes, Rose water, Rose oil. It contains Essential oils.

***Tinospora cordifolia* (Guduchi)**
Tinospora cordifolia is commonly called heart – leaved moonseed, guduchi, and giloy. Belongs to the family menispermaceae. In drug industry as a cure to many life threatening diseases. Leaves are heart shaped. Flowers are yellow, fruits are turning red when ripe, young stems are green in colour, and stem surfaces are smooth, bitter in taste. It is widely used in folk and Ayurveda system of medicine in India since ancient times. The whole plant is used for the therapeutic purpose. It is widely used as anti-diabetic, immunomodulatory, anti HIV, anti-cancer, anti-toxic, anti-microbial, anti-oxidant. The active

components present in tinospora cordifolia are alkaloids, diterpenoid lactones, glycosides, sesquiterpenoid, aliphatic compounds and others.

***Withania somnifera* (Ashwagandha)**

It is also known as Ashwagandha, Indian ginseng, Poison gooseberry or Winter cherry is a plant in the Solanaceae family. It is used as an herb in Ayurveda medicine. The plant grows from sea level to an altitude of 1500m. The root of withania somnifera are used to prepare the herbal remedy ashwagandha which has been traditionally used to treat various symptoms and conditions. It has been widely used as sedative and hypnotic, hypotensive, respiratory stimulant acting along with bradycardia, immuno-modulatory agent and having anti-stress activity, used as sexual stimulant, used in the treatment of rheumatism, used in anti-tumour activity. The main chemical constituents are alkaloids and steroidal lactones. These include tropine and cuscohygrine. The leaves contain the steroidal lactones, withanolides, notably whithaferin A, which was the first withanolide to be isolated from W. somnifera.

Zingiber officinalis

Ginger is the Asia's most treasured spice and healthiest food, its root is the rhizome of the pant zingiber officinale belongs to the family Zingiberaceae. Ginger act as useful food preservative. Fresh ginger yellow, white or red in colour depending on variety covered with brownish thick or thin skin. It is used in the treatment of antiarthritis, carminative, antiemetic, anti-inflammatory, anti-oxidant, against fibromyalgia syndrome, ant allergic. It contains zingiberine, gingerols, volatile oil, oleoresin, and diterpenes.

CONCLUSION

In this study polyherbal drugs containing immunostimulant therapy such as *Acorus calamus, Alpinia officinarum, Azadirachta indica, Glycyrriza glabra, Hedyotis corymbosa, Justica Adhatoda, Piper longum, Rosa foetida, Zingiber officinali*s. Possessing immunostimulant activity was evaluated physicochemical properties, Phytochemical screening test, Anti-bacterial activity, Anti-Fungal activity, Anti-Inflammatory Studies, Anti-Oxidant studies. The main highlight of this review are the account of immunostimulant with phytochemical compounds and their mechanism of action.

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