Review Article

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REVIEW ON ANTIVIRAL ACTIVITY IN MEDICINAL PLANTS

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Abstract

A virus is a biological agent that reproduces inside the cells of living hosts. The virus attaches to a cell enters it, and releases its DNA or RNA inside the cell. The viruses DNA or RNA is the genetic material containing the information needed to replicate the virus. When inflected by a virus, a host cell is forced to produce many thousands of identical copies of the original virus. The infected cell usually dies because the virus keeps it performing its normal functions. When it dies, the cell releases new virus which go into infect other cell. Viruses spread in many different ways. Influenza are spread through air, Norovirus are transmitted through faecal oral route, contaminate hands, food and water. Rotovirus are spread by direct contact with infected children. HIV transmitted during sex. Usually the viruses are eliminated by immune system. Antiviral drugs are one class of antimicrobials and it may interfere with the reproduction of viruses or strengthen the immune response to the viral infection.

Keywords: Antiviral activity, Plant extracts, Dimethyl sulfoxide, Bioassay, Plaque titration.

Introduction

Antiviral drugs are a class of medication used specifically for treating viral infections. The term 'Antiviral agents' has been defined in very broad terms as " Substances other than a virus or virus containing vaccine or specific antibody which can produce either a protective or therapeutic effect to the virus infected host[1]. Unlike most antibiotics, antiviral drugs do not destroy their development. The medicinal plants containing antiviral properties are relatively harmless to the host, and therefore can be used to treat infections. Research on antiviral natural products is mainly focused on plants, Since, among other reasons, they can be selected on the basis of plants, known to contain highly active antiviral constituents, is listed in table 1 and the importance of this strategy is clearly demonstrated by the increasing number of reviews on antiviral plant products. These reviews evaluate the current state of the art on plant- derived antiviral substances.

Biologically active plants as a source of antiviral agents

Medicinal plants have been traditionally used for different kinds of ailments including infectious disease. There is an increasing need for substances with antiviral activity since the treatment of viral infections with the available antiviral drugs often leads to the problem of viral resistance. Medical Plants produce a variety of chemical constituents with potential to inhibit viral replication and

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compounds from natural sources are of interest as possible sources to control viral infection. These plants have been widely used to treat a variety of infectious and non-infectious diseases and represent an abundant source of new bioactive secondary metabolites. Essential oils, odors and volatile products of plant secondary metabolism, have a wide application in folk medicine as well as fragrance industries.[2]

A Number of compounds extracted from various species of higher plants have shown antiviral activity. Examples included tannins, Flavones, Alkaloids, that displayed in vitro activity against numerous viruses. It has been suggested that selection of plant on the basis of ethno medical considerations gives a higher hit rate than screening programmes of general synthetic products. There are number of antiviral property medicinal plants were studied by various numbers of researchers. Such as 'The antiviral activity of Indian Medicinal Plant extract Swertia Chirata was tested against HSV-Type -1' was studied.

Selection and preparation of plant extracts

Four discovery approaches for new (antiviral) agents from plants can be envisaged:
(1) Random collection of plants followed by mass screening,
(2) Selection bassed on ethno medical uses,
(3) Follow-up of existing literature leads and
(4) Chemotaxonomic approaches.

At the same time for selection of plants we know the knowledge of which part of the plant is used, how it is conserved, its posology and how it is prepared. on the other hand, the screening of extracts from randomly collected plants may produce more novel substances. After selecting the plant, some documents consists of its collection (methods such as where it is harvested during flowering, or any other stage, time month etc), voucher specimens, photographs, and written notes on collection site, season, status plant etc., After harvesting the plant or part of the plant were dried and powdered well. After that the extraction is carried out in an appropriate manner.[3, 4]

Basically the extraction process consists of maceration or percolation of dried powdered plant with suitable solvents. Sometimes, a fractionation of the total extract is carried out prior to testing in order to separate polar from non-polar compounds and acid and neutral from basic substances. It is advisable to extract the plants and to dry the extracts at low temperature to avoid destruction of thermo-labile (antiviral) constituents. Non-polar extracts can be dissolved in organic solvents such as dimethyl sulfoxide (DMSO), and in methanol (or) ethanol. DMSO also eliminates microbial contamination of the test samples.[4] Then, the plant extracts was purified and isolated and evaluated by means of bio-assay method.[5]

Evaluation method

Suitable methods for evaluating antiviral properties of plants and their extracts include use of animal models, animal protection studies, egg inoculation studies and cell culture methods.[5]

The earlist method for the study of viruses had been the use of animal host systems The Animals like rabbits, mice, were used for preparation of attenualeted virus preparation (Vaccine) by Lonis Pasteur and yellow fever Vaccine by walter read in 1900 respectively. Man Thailler in 1937 in Propagate the virus in chick embryo and to produce an attenuated vaccine-the 17-D strain that is still use today. inoculation of fertilized hen eggs with the virus strain under study has been a powerful virological tool especially in the area of virus identification, vaccine production, and in the evaluation of compounds for antiviral activities.[6]

Antiviral assays

It Consists of Cytotoxicity technique for determine their maximum tolerated concentration (MTC), Virucidal activity of plant extract was determined by plaque titration method and the effect of plant extracts on viral replication and the effect of plant extracts on viral absorption are also included in this evaluation.

Conclusion

In Conclusion since the chemotherapeutic agents available for some infectious disease such as HSV, HIV influenza, hepatitis etc. are either low in quality or limited in efficiency, there is need to search for new and more effective antiviral agents from plant extracts to know about the screening method of medicinal plants.

Table No. 01: Some Antiviral medicinal plants

S.No	Species	Family Name	Activity	Class
1	Cabuncala spp	____	Influenza	Alkaloids
2	Cupressus semperviens L.	Cupressaceae	HIV	Tannins
3	Citrus Sinensis	Rutaceae	Antiviral	Isoflavones
4	Ephedra Sinica	Ephedraceae	Influenza	Flavonoids
5	Euphorbia Poissonic pox	____	HIV	Phorbolesters
6	Eucalyptus odorata	Myrtaceae	Influenza	Terpenoids
7	Glycyrrhiza glabra L.	Leguminsae	Influenza	Terpenes
8	calophyllum Lanigerum Miq.var. austrocoriaceum	Guttiferae	HIV	Coumarins
9	Melia zedarach L.	Meliaceae	HSV	Proteins
10	Ricinas communis L.	Euphorbiaceae	HIV	Proteins
11	Rheum palmatum	____	HSV	____
12	Mahonia leschauttia Takeda	Berberidaceae	Hepatitis	____
13	Phyllanthus Urinaria	____	Hepatitis B	____
14	Polygonum mtiflorum	____	Hepatitis B	____
15	Podophyllum peltatum L.	Leguminosae	HIV	Lignans
16	Phaseolus vulgaris L.	Leguminosae	HIV	Proteins
17	Solanumtuberosum	____	Antiviral	Unknown
18	Phytolacea Americaria	____	Polio, Influenza	Protein
19	Phychatria Impacachuanha	____	Polio	Alkaloids
20	Quassia Africana Baill	Simarubaceae	HSV	Terpens
21	Zizia aptera	____	Antiviral	Coumarin alerivative

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