

“Monitoring the Prevention, Treatment and cold-related illness of Influenza by Natural Herbal Remedies.”

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ABSTRACT: Influenza is a viral infection that criticises the respiratory system through the nose, throat, and lungs. Influenza is commonly called the 'flu'. And therefore, although the annual influenza vaccine is not 100% effective, it is still the best defence against the flu.

The information source did collect by different database committees and agencies like PubMed, MOOSE, PRISMA, Research Gate, and Indian Herbal Pharmacopoeia.

The acting plants extract (like Tomato, liquorice roots, Korean red ginseng, North American ginseng, antiwear, berries, Echinacea, pomegranate, guava tea, Scutellaria baicalensis Georgi, Bai Shao, and many other herbal extracts) were found effective therapeutic agents for human being fighting against influenza on account of their low cost, easy preparation, and significant antiviral action.

KEYWORDS: The National Library of Medicine (PubMed), Meta-Analyses and Systematic Reviews of Observational Studies (MOOSE), PRISMA-Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

I. INTRODUCTION

Respiratory viruses are a significant cause of influenza-like illness symptoms in children and adults and lead to considerable morbidity and mortality each year [1]. The frequent changes in the viral antigenic structure make it difficult to develop vaccines, especially for RNA viruses. Our Ayurvedic medicine system is an ancient medicinal system, a good knowledge store for herbals and minerals having medicinal properties. India is the biggest producer of medicinal herbs and is named the 'Botanical Garden'. Over 1.5 million practitioners of a traditional therapeutic system use a medicinal plant in preventive, promotional, and curative applications. The World Health Organization (WHO) supports traditional medicine, provided they are proven to be productive and safe.

Many people living in the third world thrive out of extreme poverty and suffer a lot to receive safe water and medicine; they have no alternative for primary health care [2]. Influenza – A (H1N1) (Earlier known as swine flu) is a swine flu is, respiratory disease detected in Mexico in 2009; it has spread to many caused by viruses that infect the countries in the world [3].

Like nasopharyngitis, acute viral rhinopharyngitis, acute coryza, or a cold, the common cold is a viral infectious disorder of the upper respiratory system caused primarily by rhinoviruses and coronaviruses. Whereas influenza is a contagious respiratory tract infection caused by one of three influenza viruses: A, B, and C. influenza C viruses cause mild infections in infants and young children, which may confer life-long immunity. Influenza A B viruses cause seasonal epidemics in all ages [4,5]. In adults' cases are rare and usually asymptomatic.

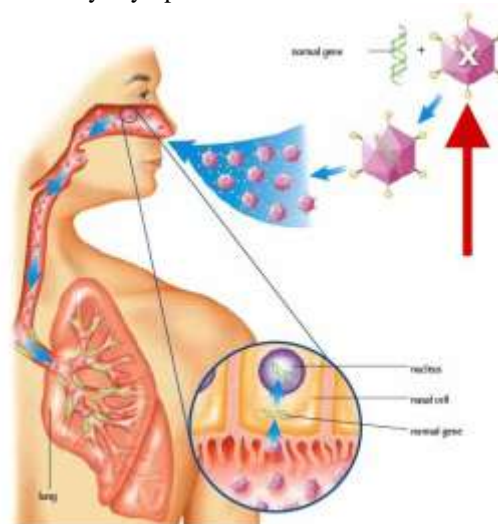


Fig 1: Attack of the virus on respiratory tract [6].

Ayurveda, Siddha, Unani, and Folk (tribal) medicines system are the great systems of indigenous medicines. Among these systems, Ayurveda is the most developed and widely practised in India [7]. Unlike many diseases, which will attribute to modern man's lifestyle. It does commonly referred to as flu; it is an infectious disease caused by RNA viruses of the family Orthomyxoviridae (the influenza viruses), affecting birds and mammals. Swine influenza is an infection by several types of swine influenza virus. The essential symptoms of the disorder are chills, fever,

II. INFORMATION SOURCE

PubMed-The National Library of Medicine database was explored from its earliest records through August 2015, using the keywords "influenza, colds, influenza herbal therapy, common cold herbal therapy, influenza-like illnesses, complementary treatment for influenza, dietary supplements for URTI [upper respiratory tract infection], alkaline diet, alkaline water, earthing, grounding." The type of search was limited to English language studies. Web search engines obtained additional related references. The review did conduct according to the guidelines for MOOSE-Meta Analyses and Systematic Reviews of Observational Studies and Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The articles with positive and negative outcomes were included in the review to prevent any bias in the selection. The data did obtain from epidemiological, human experimental, animal experimental, in vitro, a systematic review, observational, randomised trial, randomised controlled trial, randomised double-blinded trial, and placebo-controlled trial studies.[9, 10]

III. SOME IMPORTANT MEDICINAL HERBS OR PLANTS USED FOR THE TREATMENT OF INFLUENZA

BASIL

Ocimum sanctum. Moreover, Ocimumbasilicum is also known as Tulsi (Hindi) and Holy Basil (English) and is an aromatic plant of the family Lamiaceae. The whole plant is a treasure house of potent compounds with its leaves, seeds, roots, and flowers. It is medicinally essential and is considered divine by the Hindus—Ocimum sanctum. Moreover, Ocimumbasilicum is an excellent Ayurvedic treatment option for swine flu. Ayurvedic practitioners claim that Basil keeps the nasty swine flu virus at bay and assists in the fast healing of a diseased person. Furthermore, They claim that Basil improves the body's overall defence

sore throat, muscle pains, severe headache, coughing, weakness/fatigue, and general discomfort.

Swine influenza is also called H1N1 flu, swine flu, hog flu, and pig flu. Swine influenza virus (SIV) is any strain of the influenza family of viruses endemic in pigs. Swine flu is an emerging viral infection that is a global public health problem. There are many thousands of cases of swine flu in the present day. This new infection can see around the world in the present day. This infection is a variant of H1N1 influenza infection [8].

mechanism, increasing its ability to fight viral diseases. It does also believed to strengthen the immune system of the afflicted person. Ocimum extracts do use in ayurvedic remedies for common colds, headaches, stomach disorders, inflammation, heart disease, various forms of poisoning, and malaria to control and prevent many illnesses. The control and prevention of swine flu and Basil must consume in new conditions. The paste/juice of a minimum of 25 leaves (medium size) should ruin twice a day. Moreover, it should have on an empty stomach. O. sanctum is considered an adaptogen par excellence [11, 12]. It harmonises different processes in the body and helps acclimatise to stress. The primary chemical constituents of O. sanctum are oleanolic acid, ursolic acid, rosmarinic acid, eugenol, carvacrol, linalool, and β -caryophyllene [13]. Ocimum. Sanctum effectively treats high cholesterol and diabetes [14] and shows protection against radiation damage [15-16]. O. sanctum leaves contain the highest percentage of essential oils used in malaria. The leaves' juice is taken internally and effectively in skin diseases such as itching and fungal infections. Furthermore, Fresh leaves also cure chronic fever, and when mixed with honey and ginger juice, it is helpful in cough and bronchitis [17]. The antimicrobial properties of tulsi make it worthwhile to prevent novel H1N1 flu. and Basil is safe with no side effects and is excellent for preventing swine flu from spreading like wildfire [18].

GINGER

Zingiber officinale (Ginger) is a plant owned by the family Zingiberaceae. It is one of the natural remedies for swine flu prevention. It boosts the body's immunity level and helps protect the body. The primary characteristic odour and flavour of ginger root do cause by a mixture of zingerone, shogaols, and gingerols, volatile oils that comprise about one to three per cent of the weight of fresh ginger.

Ginger (Zingiber officinale) root has anti-nausea and anti-inflammatory effects and aids digestion. Ginger contains gingerol, a pungent

ingredient of volatile ginger oil with sulfur-containing compounds (allicin, alliin, and ajoene), enzymes (allinase, peroxidase, and myrosinase). The gingerols high the motility of the gastrointestinal tract and have analgesic, sedative, antipyretic, and antibacterial properties in laboratory animals [19]. Ginger has known to fight cold, fever, and flu conditions, and it is also suitable for reducing inflammation. Allicin produces antibiotic properties and has fibrinolytic activity, reducing platelet aggregation by inhibiting prostaglandin E2. Ginger's compounds also increase antioxidant enzymes like superoxide dismutase and glutathione peroxidase, useful in inflammatory reactions triggered by viral infections [20]. Anti-influenza agents will be isolated from *Z. officinale*. TNF- α reports an anti-influenza cytokine will say to be present in ginger [21].

GARLIC

Allium sativum, also known as Lahsan (Hindi) and Garlic (English), belongs to Alliaceae. *A. sativum* has been used throughout historical chronicles for culinary and medicinal purposes. It has a characteristic pungent, spicy flavour. Moreover, it is a powerful natural antibiotic. Garlic has natural antiviral, antibacterial, and immune-boosting properties. *A. sativum* has been old for hundreds of years to cure fungal, parasitic, and viral infections and has anti-inflammatory properties that promise the prevention of cardiovascular disease. It is known to kill the influenza virus in vitro [22]. An extract of *A. sativum* called ajoene appears to protect CD⁺ cells from attack by HIV early in the viral life cycle. The drug seems to have little toxicity at low concentrations, and its anti-HIV activity is 45 times more powerful than dextran sulfate. Ajoene is found only in fresh *A. sativum*. Recent investigations reveal that *A. sativum* harms the action of the liver enzymes in the process of protease inhibitors and raises the protease inhibitor levels. Furthermore, The in vitro antiviral activity of *A. sativum* extract (GE) on human cytomegalovirus (HCMV) did evaluate in tissue cultures, plaque reduction, and antigen assay. A dose-dependent inhibitory effect of GE was evident when GE was applied simultaneously with HCMV [23]. Garlic is in vitro antiviral effect against parainfluenza virus type 3, and human Rhinovirus type 2 will also be evaluated [24] Garlic. The evaluation study on cold incidence and duration of garlic supplements found fewer colds and cold symptoms, said a shorter time. 64 Raw garlic is more therapeutic than cooked garlic.

GOOSEBERRY

Phyllanthus Emblica is The Indian gooseberry, syn. *Emblica Officinalis*. It is a deciduous tree of the Euphorbiaceae family. Furthermore, It is also known as Amlaka (Sanskrit) and Amla (Hindi). Traditional Indian medicine is used to dried and fresh fruits of the plant. The whole plant includes the fruit, seed, leaves, root, bark, and flowers used in various Ayurvedic and Unani Medicine herbal preparations. *E. Officinalis* fruit is sour and astringent in taste, with sweet, bitter, and spicy secondary flavours from the Ayurveda. *Emblica Officinalis* is one of the best fruits known to boost the body's immune system. Since this berry is rich in Vitamin C, it helps raise the body's resistance to flu viruses. If fresh gooseberry is not available, then jam or juice is excellent. And Methanol extract of the fruit of *Emblica Officinalis* has potent inhibitory action against human immunodeficiency virus-1 reverse transcriptase. *Emblica Officinalis* aqueous extracts do use in traditional Cuban medicine for their antiviral activity against the Hepatitis B and influenza A and B viruses. The cytotoxicity of the section did test utilising colony-forming ability and growth-inhibition assays and by measuring the mitotic index. Apoptosis induction and cell-cycle kinetics did analyse by cytofluorimetric methods [25]. In Ayurvedic polyherbal formulations, *E. Officinalis* is a common constituent. It is most notably the primary ingredient in an ancient herbal preparation called Chyawanprash[26]. It is an effective adaptogen and immunity booster that could help control swine flu infection.

ANDROGRAPHIS

Andrographis paniculata is also known as Kalmegha in Hindi, and it is a herbaceous plant Acanthaceae family native to India and Sri Lanka. It does sometimes call "Indian Echinacea" because it provides much of the same benefits as Echinacea. Andrographolide, the extract's principal constituent, is implicated in its pharmacological activity. Studies will conduct on the cellular processes and targets modulated by andrographolide treatment of immune cells. *Andrographis* did found to reduce the symptoms and shorten the duration of colds in clinical trials [27]. *Andrographis paniculata* also decreased the cold symptoms, such as fatigue, sore throat, sore muscles, runny nose, headache, and lymph node swelling [28]. Echinacea and *Andrographis* are unlike any side effects. And This whole herb is widely used globally, and it is now beginning to obtain a market in the United States. *A. paniculata* has anti-inflammatory, antipyretic (anti- fever), antiviral, and immunostimulatory properties. And these studies

have found that taking *Andrographis* supplements upon feeling symptomatic relieves symptoms, leading to quicker recovery, and prevents post- influenza complications [29].

GILOY

Tinospora cordifolia is also called Guduchi and is a herbaceous vine of the family Menispermaceae local to tropical areas of India, Myanmar, and Sri Lanka. Take a one-foot-long branch of Giloy herb (*Amta*) and seven leaves of *Tulsi*. Mix them and extract the juice of this mixture into a vessel. Then Boil this juice and drink it. This herbal juice will increase body resistance up to three times and prevent swine flu infection. It has Anti-periodic, Anti-pyretic, Alterative, Diuretic, and Anti-inflammatory properties. These active constituents are diterpene compounds, including *Tinospora*, *Tinospora* acid, berberine, Giloin, crude Giloinin, syringin, the yellow alkaloid and a glucosidal bitter principle, as well as polysaccharides, including arabinogalactan polysaccharide (TSP) [32-33]. These compounds possess immunomodulating adaptogenic properties. Picrotene and bergenin have antioxidant properties and have been reported from *Tinospora*. *T. cordifolia* was analysed extensively for these immunomodulating activities. The active principles of *Tinospora cordifolia* began to possess immunomodulatory activities and caused significant excess in antibodies IgG in serum, along with macrophage activation [34]. The leukocyte migration inhibition tests observed enhancement in humoral immunity, evidenced by the hemagglutination titre, along with stimulation of cell-mediated immunity [35]. The plant has immense potential against novel H1N1 flu since it is a potent immunostimulant. It does use in fever, urinary disorders, dyspepsia, general debility, and urinary diseases. It clears out brain toxins. Moreover, It does also use in the treatment of rheumatism and jaundice. Therefore, it is often included in comprehensive Ayurvedic preparation since such toxins interfere with all bodily functions.

LICORICE

Glycyrrhiza glabra is also known as *Yashtimadhu* (Sanskrit), *Mulathee* (Hindi), and *Licorice* (English). *G. glabra* (Papilionaceae) derives its flavour principally from a sweet-tasting compound called anethole ("trans"-1- methoxy-4-(prop-1-enyl) benzene). The sweetness of liquorice comes from glycyrrhizic acid, an antiviral compound significantly sweeter than sugar [36]. Powdered liquorice root is a treat expectorant and also use for this purpose since ancient times, especially in Ayurvedic medicine. The plant's roots have been used for throat and upper respiratory tract-related infections and contain many

phenolic compounds such as flavonoids, glycosides, coumarin, and cinnamic acid derivatives. The Indian species like Glucosides, Liquiritin, and Isoliquiritin, have also been isolated. The active compounds Triterpene, and Saponins, particularly Glycyrrhizic acid, have shown antiviral activity [37], anti-inflammatory, antioxidant, and immune- modulating activities. These properties allow it to be an essential supplement for flu prevention. Polysaccharide fractions produced from *Glycyrrhiza glabra* stimulate macrophages [38] and elevate and assist immune stimulation [39]. And Also, animal studies have revealed its efficacy against influenza, mediated by stopping the virus replication [40]. Glycyrrhizic acid kills the virus's growth and inactivates virus particles [41]. Liquorice root does cure to help with sore throats. One study found glycyrrhizin (through liquorice root) protects cells from infection by the influenza A virus [42].

BAEL

Aegle marmelos, also called *Bael* (Hindi), belong to Rutaceae. It contains alkaloids, coumarins, and steroids primarily. These leaves produce active constituents like sterol, and skimianin, aegelin. The fruit's active constituent is marmorosin, which is identical to imperatorin. Coumarins contained in the fruits are also imperatorin and β sitosterol. The tree's roots have psoralen, xanthotoxin, scopoletin, and tebamide. *A. marmelos* from India possess imperatorin [43], with interesting biological properties such as anti-inflammatory, antibacterial, analgesic, and antiviral properties. The whole parts of this tree will use in Ayurveda for ages at all stages of maturity. Medicated oil prepared from bael leaves relieves recurrent colds and respiratory infections. The unripe fruit possesses significant antiviral activity.

AJWAIN

Trachyspermum Ammi is known as *Ajwain* in Hindi and *Bishops weed* in English and is a member of the Apiaceae family. The main constituents of the essential oil from the fruit are the phenols, mainly thymol and some carvacrol. The oil possesses p -cymene, g-terpinene, α - and β -pinenes, dipentene, minute amounts of camphene, myrcene, and sway [44]. The essential oil is a potent antiseptic [45], antispasmodic, aromatic, bitter, diaphoretic, digestive, diuretic, expectorant, and tonic [46]. It does use internally to treat colds, coughs, influenza, and asthma. The essential oil add to various cough medicines [47].

MENTHA

Mentha piperita of the family Labiatae is a herbaceous, rhizomatous perennial plant widely used in Ayurveda [48]. It contains essential oil of about

1.2%–1.5%. And the volatile oil, also known as mentha Piperita aetheroleum, includes 30–70% free menthol esters, menthol, and more than 40 other compounds. The main components of the oil are menthol (29%), and menthyl acetate (3%–10%), menthone (20%–30%). Pharmaceutical grade oil, contained by distilling the fresh aerial parts of the plant at the beginning of the flowering cycle, is standardised to have no less than 15%–30% menthone, 44% menthol, and 5% esters. And Other compounds found in it are flavonoids (12%), polymerised polyphenols (19%), carotenes, tocopherols, betaine, and choline [49]. The antimicrobial and antiviral activity of menthol does already reported. Mentha piperita has significant antiviral activity [50]. Menthol is viricidal against influenza, herpes, and other viruses in vitro. In egg and cell-culture systems, aqueous extracts of peppermint leave exhibited antiviral activity against Influenza A, Herpes simplex virus, Newcastle disease virus, and Vaccinia virus [51]. The terpenoids oil contains such as α -pinene or β -pinene, α -phellandrene and ester-connected with menthol or isovaleric acid and free acetic acid. These are mainly responsible for the antimicrobial activity of the herb [52].

HARDE

Terminalia chebula is a deciduous tree of the family Combretaceae native to Nepal, east to southwestern China (Yunnan) and Southern Asia from India and south to Sri Lanka, Malaysia, and Vietnam. It does regard as a panacea. The dry nut "s peels from this plant did use to cure cold-related nagging coughs. The bark/peel of the nut does place on the cheek, which generates a considerable quantity of saliva as the material does not diffuse. The resulting saliva is bitter and has medicinal qualities to cure cold-related coughs. Its fruits have digestive, anti-inflammatory, anthelmintic, cardiotoxic, aphrodisiac, and restorative properties and are beneficial for coughs and colds. Terminalia chebula is a vital medicine that often promotes health through successive steps of purification and detoxification. It is known to have antimutagenic solid activity because of its rich content of vitamin C [53]. It is also an established potent free radical scavenger [54].

GREEN TEA

Green tea (*Camellia Sinensis*) is a type of tea made from the leaves of *Camellia sinensis* that has

undergone minimal oxidation during processing. Green tea is native to China, and it has become associated with many cultures in Asia, from Japan to the Middle East. It has been found more widely in the West, traditionally consumed as black tea. Green tea is particularly rich in polyphenolic and catechins compounds. Catechin constituents have shown pronounced antiviral activity and were observed for products carrying moderate chain length (7–9 carbons). The results exerted inhibitory effects for all six influenza subtypes tested, including three major types of currently circulating human influenza viruses (A/H3N2, A/H1N1, and B type) and H9N2, H2N2 avian influenza virus. The compounds strongly inhibited the adsorption of the viruses on red blood cells (RBC) [55]. The green tea shows preventive disease properties mainly due to polyphenols like epicatechin, epicatechin-3-gallate, epigallocatechin (EGC) and epigallocatechin-3-gallate (EGCG). These polyphenols contain about one-third of the weight of the dried leaf of the plant. These catechins have diverse pharmacological properties, including antioxidative, anti-inflammatory, anticarcinogenic, antimutagenic, and antimicrobial effects. Green tea can enhance humoral and cell-mediated immunity and, therefore, helps prevent influenza by inhibiting flu replication, using potentially direct virucidal products [56].

GINSENG

Panax quinquefolius, commonly known as American Ginseng, is a herbaceous perennial in the ivy family and is widely used in medicine. It is indigenous to Eastern North America, though it does also cultivated beyond its range in places such as China [57]. American ginseng contains dammarane-type ginsenosides are the major biologically active constituents. Dammarane-type ginsenosides involve two classifications: the 20(S)-protopanaxatriol (ppt) and 20(S)-protopanaxadiol (ppd) classifications. American ginseng contains high levels of Rb1, Re (ppt classification) and Rd (ppd classification) ginsenosides that are helpful in the prevention of the common cold. In Eastern Europe, ginseng does widely used to improve overall immunity to illness. It seems that regular use of ginseng may prevent colds. Studies on *Panax* have revealed that they effectively provide immunity to individuals against influenza [58].

IV. CLASSIFICATION OF BOTANICALS FOR USE IN INFLUENZA

Category	Function	Botanicals
Antiviral herbs	Inhibiting viral growth	Thyme leaf (<i>Thymus vulgaris</i>) Honeysuckle flowers (<i>Lonicera japonica</i>) Andrographis (<i>Andrographis paniculata</i>) Yarrow (<i>Achillea millefolium</i>) Peppermint leaf and oil (<i>Mentha piperita</i>) Calendula (<i>Calendula officinalis</i>)
Diaphoretic herbs	Promote sweating and the release of toxins	Boneset (<i>Eupatorium perfoliatum</i>) Elderberry (<i>Sambucus nigra</i>)
Expectorants	Expels phlegm	Tulsi (<i>Ocimum sanctum</i>) Snakeroot (<i>Polygala senega</i>) Liquorice Root (<i>Glycyrrhiza glabra</i>) Clove (<i>Syzygium aromaticum</i>) Slippery Elm and Marshmallow Osha root (<i>Ligusticum porteri</i>) Sage leaf (<i>Salvia officinalis</i>)
Immuno stimulant	Increase antibody production, raise white blood cell counts, and stimulate the activity of key white blood cells	Echinacea root (<i>Echinacea purpurea</i>) Eucalyptus (<i>Eucalyptus globules</i>) Garlic (<i>Allium sativum</i>) Ginseng (<i>Panax quinquefolium</i>) Marshmallow (<i>Althea Officinalis</i>) Slippery elm (<i>Ulmus fulva</i>) Isatis root (<i>Isatis tinctoria</i>) Usnea lichen (<i>Usnea barbata</i>) Myrrh resin (<i>Commiphora myrrh</i>) Ginger root (<i>Zingiber officinale</i>)
Febrifuges	Reduces raised body temperature	Banafsha (<i>Viola odorata</i>)

V. IMPORTANCE OF HERBAL MEDICINE OVER CONVENTIONAL THERAPIES

Globally herbal products have been used for thousands of years in folk medicines. Many have pharmacological properties, such as antimicrobial, anti-inflammatory, and cytostatic effects. They have been perceived as beneficial for human use as medicinal. Of these, many herbal medicines identified a role in preventing and controlling influenza or swine flu [31]. Conventional treatments usually address symptoms, while herbal therapies can often improve or even reverse a condition by identifying and treating the root cause, as they do attribute with:

- i. Facile availability to administer;
- ii. With fewer or less harmful side effects;
- iii. Generally well tolerated;
- iv. Good immune modulators;
- v. Raises resistance against pathogens;
- vi. Strengthens the immune system. Herbal medicine is environment friendly, cheaper, and safer, with higher efficacy over time. In addition, these do characterise by anti-ageing, stress-relieving, and cryoprotective properties.

VI. CONCLUSION

Several herbal therapies were proven effective for preventing or treating influenza and influenza-like illnesses. The active antiviral substances were obtained by aqueous or ethanolic extracts of a single or mixture of herbs. The

effective plants were used traditionally in certain nations to treat respiratory viral infections. Tomato, liquorice roots, Korean red ginseng, North American ginseng, antiwei, berries, Echinacea, pomegranate, guava tea, *Scutellaria baicalensis* Georgi, Bai Shao, and many other herbal extracts were found, effective therapeutic agents. The mechanism of action (MOA) is related to substances in the herbs that prevent viral replication in the human body. The identified active ingredients against respiratory viruses are neuraminidase inhibitors, glycyrrhizin (stimulating IFN-gamma production by T cells), polyphenol (causes virion structural damage), and baicalin (neuraminidase inhibitor).

On global consideration, using plant/herbal products as anti-influenza has a traditional history in India and ancient civilisations in Arab, America, and China. Herbs are an effective method for human beings fighting against influenza because of their low cost, easy preparation, and significant antiviral action.

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