

## Swine Flu and Its Herbal Remedies

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### Abstract

Ayurveda, Siddha, Unani and Folk (Tribal) medicines are the major systems of indigenous medicines. Unlike many diseases, this can be attributed to the life style of modern man. Swine flu is a disease of the respiratory system. It is caused by the H1N1 virus. It has been declared as a pandemic by the World Health Organization. People who used to have direct contact with pigs were observed to get swine flu in the past. But, H1N1 virus is a new swine flu virus and it contains the genetic material of swine, bird and human influenza virus. Swine flu can produce a number of symptoms in both adults and children. Swine flu natural remedies and swine flu herbal remedies are better treatment options, and they are free of side effects. Ayurvedic medicines and plant based medicines are using for swine flu; it has less side effect ,it is very safe for human beings. More than 700 plants like Ginger (*Zingiber officinale*) and Holy Basil (*Ocimum sanctum*) etc are using for many types of disease including swine flu. These plants have lot of antibiotic property.

**Key Words:** Ayurveda, Natural herbs, Medicinal plant, swine flu

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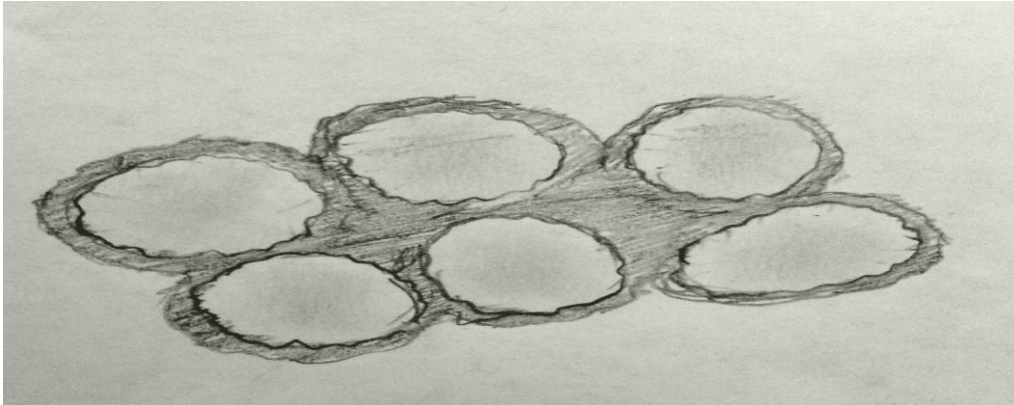
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### I. INTRODUCTION

Herbs are staging a comeback and herbal 'renaissance' is happening all over the globe. The herbal products today symbolize safety in contrast to the synthetics that are regarded as unsafe to human and environment. Although herbs had been priced for their medicinal, flavoring and aromatic qualities for centuries, the synthetic products of the modern age surpassed their importance, for a while. However, the blind dependence on synthetics is over and people are returning to the naturals with hope of safety and security. Over three-quarters of the world population relies mainly on plants and plant extracts for health care. More than 30% of the entire plant species, at one time or other was used for medicinal purposes. It has been estimated that in developed countries such as United States, plant drugs constitute as much as 25% of the total drugs, while in fast developing countries such as China and India, the contribution is as much as 80%. Thus, the economic importance of medicinal plants is much more to countries such as India than to rest of the world. These countries provide two third of the plants used in modern system of medicine and the health care system of rural population depend on indigenous systems of medicine.

Ayurveda, Siddha, Unani and Folk (tribal) medicines are the major systems of indigenous medicines. Among these systems, ayurveda is most developed and widely practiced in India[1].Unlike many diseases, which can be attributed to the life style of modern man.Commonly referred to as flu, It is an infectious disease caused by RNA viruses of the family Orthomyxoviridae (the influenza viruses), that affects birds and mammals. The most common symptoms of the disease are chills, fever, sore throat, muscle pains, severe headache, coughing, weakness/fatigue and general discomfort. Swine influenza is an infection by any one of several types of swine influenza virus.

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 that is endemic in pigs. Swine flu is an emerging viral infection that is a present global public health problem. There are many thousands cases of swine flu in the present day. This new infection can be seen around the world in the present day. This infection is a kind of variant of H1N1 influenza infection. (Figure 1)[2].



**Figure1: Electron microscopic image of H1N1 influenza virus**

The problematic virus was firstly detected in America in 2009 and this virus is the most widely studied virus in the present day. Due to the nature of respiratory virus, the transmission of this pathogenic virus is air borne transmission. Hence, the rapid spreading and difficulty in control of this infection can be expected. As of 2009, the known SIV strains include influenza C and the subtypes of influenza A known as H1N1, H1N2, H3N1, H3N2, and H2N3. In August 2010 the World Health Organization declared the swine flu pandemic officially over [3-4].

### 1.1 How it spread?

Like most viruses, it enters the body through the mucous membranes - the eyes, the nose or the mouth. Swine flu is spread just like the regular seasonal flu spreads. It goes from person to person through close contact and direct touch, indirect touch, or respiratory droplets that carrying the virus. Infected person may be able to infect others beginning one day before symptoms develop and up to seven or more days after becoming sick. Swine influenza viruses are not transmitted by food. Any person cannot get swine influenza from eating pork or pork products. Every virus, bacteria or pathogen of any time has a certain incubation period.. Like all influenza pathogens the average incubation period is two days. However, individual periods to range between one day to seven days [5].

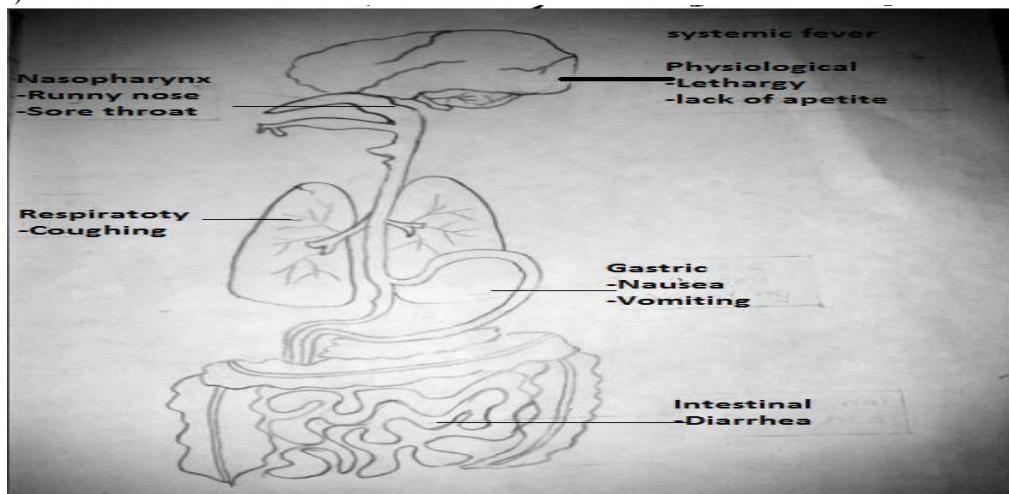
### 1.2 Signs and symptoms

#### In Swine

In pigs influenza infection produces fever, lethargy, sneezing, coughing, difficulty breathing and decreased appetite [6].

#### 1.3. In Humans

Symptoms include fever, cough, sore throat, body aches, headache, chills and fatigue [7-8]. The 2009 outbreak has shown an increased percentage of patients reporting diarrhea and vomiting [9]. The 2009 H1N1 virus is not zoonotic swine flu, as it is not transmitted from pigs to humans, but from person to person [10]. (Figure 2)



**Figure 2: Symptoms of human**

#### 1.4 DIAGNOSIS

The diagnosis of swine flu is not easy than other disease diagnosis. The Centers for Disease Control and Prevention (CDC) recommends real time RT-PCR as the method of choice for diagnosing H1N1. This method allows a specific diagnosis of novel influenza (H1N1) as opposed to seasonal influenza. Near-patient points of care tests are in development[11-12]. Another methods are Rapid Antigen Tests, virus isolation, virus genome sequencing[13].

#### 1.5 PREVENTION

Prevention of swine influenza has three components namely prevention in swine, prevention of transmission to humans, and prevention of its spread among humans [14]. Methods of preventing the spread of influenza among swine include facility management, and vaccination [15-16].

#### 1.6 TREATMENT

##### Vaccination

Vaccines have been developed to protect against the virus that causes swine flu. There are two different brands of vaccine Pandemrix and Celvapan [17].

##### 1.7 Antiviral therapy

Two classes of antiviral drugs are available for the prevention and treatment of influenza: neuraminidase inhibitors and adamantanes, which inhibit a viral protein called M2. Influenza as H1N1, formerly known as swine flu, has been found to be resistant to adamantanes (Amantadine and Rimantadine). Oseltamivir (Tami flu) and Zanamivir (Relenza) are the two neuraminidase inhibitors currently available [18-19].

##### 1.8 Ayurveda

Ayurveda promotes the concept that if one's immune system is strong, then even if the body is exposed to viruses, one will not be affected. During a pandemic or an epidemic, Ayurveda emphasizes on the immunity of people living in regions affected by viruses. This branch of medicine promotes the intake of special herbs or decoctions to increase the immunity level of the people. Ayurvedic remedies comprise pure natural herbs which are effective in preventing swine flu. Moreover, the herbs are used to relieve swine flu symptoms, and boost the immune system against the H1N1 virus.

##### 1.9. Some important medicinal natural herbs or plants used for the treatment of swine flu

**Basil:** *Ocimum sanctum*. and *Ocimum basilicum* also known as Tulsi (Hindi) and Holy Basil (English), is an aromatic plant of the family Lamiaceae. The plant, as a whole, is a treasure house of potent compounds with its leaves, seeds, and roots, as well as flower being medicinally important and is considered divine by the Hindus. *Ocimum sanctum*. and *Ocimum basilicum* are great Ayurvedic treatment option for swine flu. Ayurvedic practitioners claim that basil not only keeps the nasty swine flu virus at bay, but it also assists in the fast recovery of an affected person. They claim that basil improves the body's overall defense mechanism, there by increasing its ability to fight viral diseases. It is also believed to strengthen the immune system of the afflicted person. For the control and prevention of many disease, *Ocimum* extracts are used in ayurvedic remedies for common colds, headaches, stomach disorders, inflammation, heart disease, various forms of poisoning, and malaria. For the control and prevention of swine flu, basil must be consumed in the fresh form. The paste or juice of a minimum of 25 leaves (medium size) should be consumed twice a day. Moreover, it should be had on an empty stomach. *O. sanctum* is considered to be an adaptogen par excellence [20-21]. It harmonizes different processes in the body and is helpful in acclimatizing to stress. The main chemical constituents of *O. sanctum* are oleanolic acid, ursolic acid, rosmarinic acid, eugenol, carvacrol, linalool, and  $\beta$ -caryophyllene [22]. *O. sanctum* is reported to be an effective treatment for diabetes and high cholesterol [23]. *O. sanctum* also shows promise for protection against radiation damage [24-25]. *O. sanctum* leaves contain highest percentage of essential oils, infusion of which is given in malaria. Juice of the leaves is taken internally and is very effective in skin diseases such as itches fungal infections. Fresh leaves also cure chronic fever and when mixed with honey and ginger juice, it is useful in cough and bronchitis [26]. The antimicrobial properties of *O. sanctum* make it useful for the prevention of novel H1N1 flu. Basil is safe, with no side effects and is great to prevent swine flu from spreading like wildfire [27].

## II. GINGER

*Zingiber officinale* (Ginger) is a plant which belongs to the family Zingiberaceae. *Zingiber officinalis* is one of the natural remedies for swine flu prevention. It boosts the body's immunity level and helps protect the body. The characteristic odor and flavor of ginger root is caused by a mixture of zingerone, shogaols, and gingerols, volatile oils that comprise of about one to three percent of the weight of fresh ginger.

Ginger, (*Zingiber officinale*) root, which has anti-nausea and anti-inflammatory effects and also aids digestion. In laboratory animals, the gingerols increase the motility of the gastrointestinal tract and have analgesic, sedative, antipyretic, and antibacterial properties [28]. Ginger contains gingerol, a pungent ingredient of ginger volatile oil with sulphur-containing compounds (allicin, alliin, and ajoene), and enzymes (allinase, peroxidase, and myrosinase). The antibiotic properties of allicin are well known. The allicins have fibrinolytic activity, which reduces platelet aggregation by inhibiting prostaglandin E2. Compounds in ginger also increase levels of antioxidant enzymes, including superoxide dismutase and glutathione peroxidase, which may be beneficial in inflammatory reactions triggered by viral infections [29]. Anti-influenza agents have been isolated from *Z. officinale*. TNF- $\alpha$ , reported as anti-influenza cytokine, has been reported to be present in ginger [30]. Ginger has been known to fight cold, fever and flu conditions, and is also good to reduce inflammation.

### III. GARLIC

*Alium sativum*, also known as Lahsan (Hindi) and Garlic (English), belongs to family Alliaceae. *A. sativum* has been used throughout recorded chronicles for both culinary and medicinal purposes. It has a characteristic pungent, spicy flavor. *Allium sativum* on the other hand is a powerful natural antibiotic. Garlic has natural antiviral, antibacterial, and immune-boosting properties. *A. sativum* has been used for hundreds of years to treat fungal, parasitic, and viral infections, and has anti-inflammatory properties that show promise for prevention of cardiovascular disease. It is known to kill influenza virus in vitro [31]. An extract of *A. sativum* called ajoene, which appears to protect CD+ cells from attack by HIV early in the viral life cycle. At low concentrations, the drug appears to have little toxicity, and its anti-HIV activity is 45 times more powerful than the drug dextran sulfate. Ajoene is found only in fresh *A. sativum* and is not readily procurable. Recent investigations reveal that *A. sativum* impairs the activity of the liver enzymes that process protease inhibitors and raises the protease inhibitor levels. The *in vitro* antiviral activity of *A. sativum* extract (GE) on human cytomegalovirus (HCMV) was also evaluated in tissue cultures, plaque reduction, and early antigen assay. A dose-dependent inhibitory effect of GE was evident when GE was applied simultaneously with HCMV [32]. The *in vitro* antiviral effect of garlic against para influenza virus type 3 and human Rhinovirus type 2 has also been evaluated [33]. Garlic. A study evaluating a garlic supplement on cold incidence and duration found that fewer colds were reported by those taking the supplements, than those that did have cold symptoms reported a shorter duration. 64 Raw garlic has been found to be more therapeutic than cooked garlic.

### IV. GOOSEBERRY

*Phyllanthus emblica*. The Indian gooseberry (*Phyllanthus emblica*, syn. *Emblica officinalis*) is a deciduous tree of the Euphorbiaceae family. It is also known as Amlaka (Sanskrit) and Amla (Hindi). In traditional Indian medicine, dried and fresh fruits of the plant are used. All parts of the plant, including the fruit, seed, leaves, root, bark, and flowers, are used in various Ayurvedic/Unani Medicine herbal preparations. According to Ayurveda, *Emblica officinalis* fruit is sour and astringent in taste, with sweet, bitter, and pungent secondary tastes. *Embelica officinalis* is one of the best fruits known to boost the immune system of the body. Since gooseberry is rich in Vitamin C, it helps raise the body's resistance to flu viruses. If fresh gooseberry is not available in the market, then the form of jam or juice is also great. Methanol extract of the fruit of *Emblica officinalis* has potent inhibitory action against human immunodeficiency virus-1 reverse transcriptase. *Emblica officinalis* aqueous extracts are used in Cuban traditional medicine for their antiviral activity against Hepatitis B virus and A and B influenza virus. The cytotoxicity of the extract was tested by means of colony-forming ability and growth-inhibition assays, as well as by measuring the mitotic index. Apoptosis induction and cell-cycle kinetics were analyzed by cytofluorimetric methods [34]. In Ayurvedic polyherbal formulations, *Emblica officinalis* is a common constituent, and most notably is the primary ingredient in an ancient herbal preparation called Chyawanprash [35], which is itself an effective adaptogen and immunity booster that could help control swine flu infection.

### V. ALOE VERA

*Aloe vera* is an easily available plant and is also beneficial to boost immunity. One should consume a teaspoon of gel with water on a daily basis.

### VI. CAMPHOR AND EUCALYPTUS OIL

Camphor has great ability to keep different air borne diseases under control. It is available in the form of camphor oil, which can be burnt in the room or office all the time. Inhaling the steam of Eucalyptus oil is also good. Just add a few drops of Eucalyptus oil into lukewarm water and inhale the steam. This helps to clear the nasal track and promotes the health of the respiratory tract. Thus, it can be seen that while swine flu and Ayurveda both target the immune system, swine flu destroys it and Ayurveda focuses on keeping it.

## VII. GILOY

*Tinospora cordifolia*. *Tinospora cordifolia*, also called Guduchi, is an herbaceous vine of the family Menispermaceae indigenous to the tropical areas of India, Myanmar, and Sri Lanka. Take a one foot long branch of Giloy herb (Amta) and seven leaf of Tulsi. Mix them and extract juice of this mixture in a vessel. Boil this juice and drink it. This herbal juice will increase body resistant up to three times and prevent infection of swine flu. It has Anti-periodic, Anti-pyretic, Alterative, Diuretic, Anti-inflammatory properties. It is a constituent of several compound preparations. The active constituents are diterpene compounds, including tinosporone, tinosporic acid, syringen, the yellow alkaloid, berberine, Giloin, crude Giloininand, and a glucosidal bitter principle, as well as polysaccharides, including arabinogalactan polysaccharide (TSP) [36-37]. These compounds possess adaptogenic and immunomodulating properties. Picrotene and bergenin, possessing antioxidant properties have been reported from *Tinospora*. *Tinospora cordifolia* has been studied extensively for its immunomodulating activities. The active principles of *Tinospora cordifolia* were found to possess immunomodulatory activities and caused significant increases in Ig G antibodies in serum, along with macrophage activation [38]. Enhancements in humoral immunity, evidenced by the hemagglutination titre, along with stimulation of cell mediated immunity were observed in the leukocyte migration inhibition tests [39]. The plant has immense potential for use against novel H1N1 flu since it is a potent immunostimulant. It is used in fever, urinary disorders, dyspepsia, general debility and urinary diseases. It is also used in treatment of rheumatism and jaundice. Therefore it is very often included in comprehensive Ayurvedic formulas, since such toxins interfere with all bodily functions and are a factor in almost all diseases. It clears out brain toxins that hinder mental activity.

## VIII. LICORICE

*Glycyrrhiza glabra* also known as Yashtimadhu (Sanskrit), Mulathee (Hindi), and Licorice (English), *Glycyrrhiza glabra* (Papilionaceae) derives its flavor principally from a sweet-tasting compound called anethole ("trans"-1- methoxy-4-(prop-1-enyl) benzene). Additional sweetness in licorice comes from glycyrrhizic acid, an antiviral compound significantly sweeter than sugar [40]. Powdered licorice root is an effective expectorant, and has been used for this purpose since ancient times, especially in Ayurvedic medicine. The roots of the plant have been used for throat and upper respiratory tract-related infections and contain many phenolic compounds such as flavonoids and their glycosides, coumarin, and cinnamic acid derivatives. Particularly from the Indian species, Glucosides, Liquiritin, and Isoliquiritin have also been isolated. The active compounds Triterpene, Saponins, particularly Glycyrrhizic acid have shown antiviral activity [41] anti-inflammatory, antioxidant, and immune-modulating activities. These properties allow it to be an important supplement for flu prevention. Polysaccharide fractions obtained from *Glycyrrhiza glabra* stimulate macrophages [42] and hence elevate and assist immune stimulation [43]. Also animal studies have revealed its efficacy against the influenza A virus that is mediated by stopping the virus replication [44]. Glycyrrhizic acid present in the plant inhibits virus growth and inactivates virus particles [45]. One study found that licorice root (through glycyrrhizin) protects cells from infection with Influenza A virus and, in already-infected cells, caused a drastic reduction in the number of infected cells [46]. Licorice root has also been shown to help with sore throats.

## IX. ANDROGRAPHIS

*Andrographis paniculata* (Kalmegha in Hindi) is an herbaceous plant in the family Acanthaceae, native to India and Sri Lanka. It is sometimes called "Indian Echinacea" because it is believed to provide much the same benefits as Echinacea. Andrographolide, the major constituent of the extract is implicated towards its pharmacological activity. Studies have been conducted on the cellular processes and targets modulated by andrographolide treatment of immune cells. *Andrographis* was found to both reduce the symptoms and shorten the duration of colds in clinical trials<sup>45</sup>. *Andrographis paniculata* also reduced the cold symptoms; such as fatigue, sore throat, sore muscles, runny nose, headache, and lymph node swelling<sup>46</sup>. Unlike the Echinacea, *Andrographis* does not have any side effects. This herb is widely used in many parts of the world and is now beginning to gain a market in the United States. *Andrographis* has anti-inflammatory, antipyretic (anti-fever), antiviral, and immunostimulatory properties and studies have found that taking *andrographis* supplements upon feeling symptomatic relieves symptoms, leads to quicker recovery, and prevents post-influenza complications [47].

## X. ASHWAGANDHA

*Withania somnifera*, Ashwagandha is a tonic herb, similar to ginseng, which belongs to the family Solanaceae; which is recommended to increase energy and endurance, strengthen immune function, and help the body overcome imbalance caused by mental or physical stress, poor diet, lack of sleep, or environmental toxins [48]. It has Stimulant for the immune system, also a very potent adaptogen. Its principal compounds

include like anaferrine, anahygrine, beta-sisterol, chlorogenic acid, cysteine, cuscohygrine, pseudotropine, scopoletin, somniferinine, withaferin  $\alpha$ , withanine, withananine, and withanolides. Researchers who studied Ashwagandha along with other Ayurvedic plants found that it stimulated the immune system and had no toxic effects. Ashwagandha is available in powdered form, capsules, and as a liquid extract. A traditional dose is 1-2 g of the dried, powdered root, taken one to three times daily, or a standardized extract dose is 100-200 mg twice per day.

## XI. TURMERIC

*Curcuma longa* is also known as turmeric. This compound is highly used in Ayurvedic and Chinese medicine to address many health concerns. It helps to stabilize the body and is a strong antioxidant with anti-inflammatory properties as well. It has also been found to guard against free radical damage, protects the liver from toxic compounds, prevents blood platelet aggregation, stimulates the gallbladder, detoxifies the body and boosts the immune system. Curcumin in Turmeric is responsible for these effects [49].

## XII. ISATIS

Both the leaf and the root of this Chinese plant have been used to treat various infections, including influenza and upper respiratory infections. Studies have shown the root extract to be antibacterial, antiviral and antiparasitic against many different types of viruses and bacteria. This is likely because Isatis increases white blood cell and lymphocyte counts in the blood. It is also has cooling effects which is used to reduce fevers. Isatis is commonly combined with astragalus in herbal formulas [50].

## XIII. NEEM

*Azadirachta indica*. *Azadirachta indica* (Neem in Hindi) is a tree in the mahogany family Meliaceae. Three bitter compounds that have been extracted from neem oil are nimbin, nimbinin, and nimbidin, respectively [51]. The seeds contain a complex secondary metabolite azadirachtin. All parts of the plant yield  $\beta$ -sitosterol. The antiviral activity of azadirachtin, nimbin, and nimbidin has been reported. *Azadirachta indica* extracts possess antidiabetic, antibacterial, and antiviral properties. The tree stem, root, and bark possess astringent and tonic properties [52-53]. *In vitro* antiviral activity of aqueous neem leaves extract, assessed in cloned cells of larvae of *Aedes albopictus* cells employing virus inhibition assay, showed inhibition in a dose-dependent manner [54]. *Azadirachta indica* has traditionally been used as an antiviral, and animal and laboratory research has shown promising results. While researchers have still not pinpointed the exact mode of action of neem phytoconstituents, there is some evidence to show that they interfere with viral reproduction, thus minimizing the impact of viral infections. The effect of *A. indica* leaf extract and pure compound (Azadirachtin) on the replication of Dengue virus type-2 has also been reported. Thus, neem can serve as a source of promising future antiviral drugs [55].

### 13.1 Bael

*Aegle marmelos* also called Bael (Hindi) belongs to family Rutaceae. It contains primarily alkaloids, coumarins, and steroids. The leaves contain skimianin, sterol, and aegelin. The active constituent of the fruit is marmorosin, which is identical to imperatorin. Coumarins contained in the fruits are also imperatorin and  $\beta$  sitosterol. Roots of the tree have been found to contain psoralin, xanthotoxin, scopoletin, and tebamide. *A. marmelos* from India is reported to possess imperatorin [56], which has certain interesting biological properties such as analgesic, anti-inflammatory, antibacterial, and antiviral properties. All parts of this tree-stem, bark, root, leaves, and fruit at all stages of maturity have been used in Ayurveda since ages. Medicated oil prepared from bael leaves gives relief from recurrent colds and respiratory infections. Its regular use builds up resistance to colds and coughs. The unripe fruit possesses significant antiviral activity.

### 13.2 Ajwain

*Trachyspermum ammi*. *Trachyspermum ammi* called as Ajwain in Hindi and Bishops weed in English, is a member of the family Apiaceae. The principal constituents of the essential oil from the fruit are the phenols, mainly thymol and some carvacrol. The oil possess p-cymene, g-terpinene,  $\alpha$ - and  $\beta$ -pinenes, and dipentene, minute amounts of camphene, myrcene, and careen [57]. The essential oil is a strong antiseptic [58], antispasmodic, aromatic, bitter, diaphoretic, digestive, diuretic, expectorant, and tonic [59]. It is used internally in the treatment of colds, coughs, influenza, and asthma. The essential oil is also added to various cough medicines as well [60].

### 13.3. Mentha

*Mentha*, *Mentha piperita*, family Labiatae, is an herbaceous rhizomatous perennial plant widely used in Ayurveda [61]. It contains about 1.2%–1.5% essential oil. The volatile oil, also known as menthae piperitae aetheroleum, contains 30–70% free menthol, menthol esters and more than 40 other compounds. The principal components of the oil are menthol (29%), menthone (20%–30%), and menthyl acetate (3%–10%). Pharmaceutical grade oil, produced by distilling the fresh aerial parts of the plant at the beginning of the flowering cycle, is standardized to contain no less than 44% menthol, 15%–30% menthone, and 5% esters, in addition to various terpenoids. Other compounds found in it are flavonoids (12%), polymerized polyphenols (19%), carotenes, tocopherols, betaine, and choline [62]. The antimicrobial and antiviral activity of menthol has been reported. *Mentha piperita* has significant antiviral activity [63]. Menthol is virucidal against influenza, herpes, and other viruses *in vitro*. Aqueous extracts of peppermint leaves exhibited antiviral activity against Influenza A, Newcastle disease virus, Herpes simplex virus, and Vaccinia virus in egg and cell-culture systems [64]. The oil contains terpenoids such as  $\alpha$ -pinene or  $\beta$ -pinene,  $\alpha$ -phellandren, and also ester-connected with menthol or free acetic acid and isovaleric acid, which are mainly responsible for the antimicrobial activity of the herb [65].

### 13.4. Harde

*Terminalia chebula*, is a deciduous tree of family Combretaceae native to Southern Asia from India and Nepal east to Southwestern China (Yunnan), and south to Sri Lanka, Malaysia, and Vietnam. It is regarded as a universal panacea. The dry nut's peel from this plant is used to cure cold-related nagging coughs. The bark/peel of the nut is placed in the cheek and this generates a huge amount of saliva as the material does not dissolve. The resulting saliva, bitter in taste, is believed to have medicinal qualities to cure cold related coughs. Its fruits possess digestive, anti-inflammatory, anthelmintic, cardiotonic, aphrodisiac, and restorative properties and are additionally beneficial in cough and colds. *Terminalia chebula* is an important medicine, which often promotes health through successive steps of purification and detoxification. It is known to have strong antimutagenic activity, because of its very rich content vitamin C [66]. Also it is an established potent free radical scavenger [67].

### 13.4. Green Tea

Green tea (*Camellia sinensis*) is a type of tea made solely from the leaves of *Camellia sinensis* that has undergone minimal oxidation during processing. Green tea originated in China and has now become associated with many cultures in Asia from Japan to the Middle East. Recently, it has become more widespread in the West, where black tea is traditionally consumed. Green tea is particularly rich in polyphenolic compounds and catechins. Catechin derivatives have shown pronounced antiviral activity, observed for derivatives carrying moderate chain length (7–9 carbons). The derivatives exerted inhibitory effects for all six influenza subtypes tested including three major types of currently circulating human influenza viruses (A/H1N1, A/H3N2, and B type), H2N2 and H9N2 avian influenza virus. The compounds strongly inhibited adsorption of the viruses on red blood cell (RBC) [68]. The disease preventive properties of green tea are mainly due to the presence of polyphenols like epigallocatechin-3-gallate (EGCG), epicatechin, epicatechin-3-gallate, and epigallocatechin (EGC). These polyphenols comprise about one-third of the weight of the dried leaf of the plant. These catechins have been reported to possess diverse pharmacological properties, including antioxidative, antiinflammatory, anticarcinogenic, antimutagenic and antimicrobial effects. Green tea has the ability to enhance humoral and cell-mediated immunity and therefore, useful for preventing influenza by inhibiting flu replication, using potentially direct virucidal effect [69].

### 13.5. Ginseng

*Panax quinquefolius*. *Panax quinquefolius* commonly known as American Ginseng is an herbaceous perennial in the ivy family that is commonly used in medicine. It is native to Eastern North America, though it also cultivated beyond its range in places such as China [70]. American ginseng contains dammarane-type ginsenosides as the major biologically active constituents. Dammarane type ginsenosides include two classifications: the 20(S)-protopanaxadiol (ppd) and 20(S)-protopanaxatriol (ppt) classifications. American ginseng contains high levels of Rb1, Rd (ppd classification), and Re (ppt classification) ginsenosides that are helpful in prevention of common cold [71]. In Eastern Europe, ginseng is widely used to improve overall immunity to illness. It appears that regular use of ginseng may prevent colds. Studies have been done on *Panax* to reveal that they effectively provide immunity to individuals against influenza [72].

**Table1: List of medicinal plants from world, which may prove useful to combat Swine flu.**

Sr no	Plant name	Family	Principal chemical compound	Antiinfluenza Action	References
1	Basil	Lamiaceae	oleanolic acid, ursolic acid, rosmarinic acid, eugenol, carvacrol, linalool, and $\beta$ -caryophyllene	antimicrobial properties	24
2	Ginger	Zingiberaceae	allicin, alliin,	anti-nausea and anti-inflammatory properties	29
3	Garlic	Alliaceae	ajoene	anti-inflammatory antiviral, antibacterial, and immune-boosting properties	32
4	Gooseberry	Euphorbiaceae		Anti viral activity	34
5	Giloy	Menispermaceae	tinosporone, tinosporic acid, syringe, alkaloid, berberine, Giloin, crude Giloininand	Anti-periodic, Anti-pyretic, Alterative, Diuretic, Anti-inflammatory properties	36
6	Licorice	Papilionaceae	Glycyrrhizic acid, glycosides, coumarin, and cinnamic acid	antiviral activity anti-inflammatory, antioxidant, and immune-modulating activities.	41
9	Kalmegh	Acanthaceae	Andrographolide	anti-inflammatory, antipyretic (anti-fever), antiviral, and immunostimulatory properties	45
10	Ashwagandha	Solanaceae	Anaferine, anahygrine, beta-sisterol, chlorogenic acid, cysteine, cuscohygrine, pseudotropine, scopoletin, somniferinine, withaferin $\alpha$ , withanine, withananine, and withanolides	Stimulant for the immune system, also a very potent adaptogen.	48
11	Turmeric	Zingiberaceae	Curcumin	antioxidant , anti-inflammatory properties	49
12	Neem	Meliaceae.	azadirachtin	antidiabetic, antibacterial, and antiviral properties.	52
13	Bael	Rutaceae	alkaloids, coumarins, and steroids	analgesic, anti-inflammatory, antibacterial, and antiviral properties	56
14	Ajwain	Apiaceae	phenols, thymol, carvacrol	antiseptic, antispasmodic activity	57
15	Mentha	Labiatae	Menthol, menthone, flavonoids, carotenes, tocopherols, betaine, and choline	antimicrobial and antiviral activity	62
16	Harde	Combretaceae		inflammatory, anthelmintic, cardiotonic, aphrodisiac, and restorative properties	66
17	Gingsen	Ivy	ginsenosides		71
18	Green tea		Catechin, epicatechin	antioxidative, antiinflammatory, anticarcinogenic.	69

These medicinal herbs mainly act *via* two basic approaches against H1N1 infection, namely enhancement of overall immunity of the individual or by acting against the virus by preventing viral replication or by inhibiting viral signal transduction.

#### XIV. CONCLUSION

From the above survey of information it can be well known that the Swine flu is a dangerous disorder which is spreading worldwide and this is a casual thing to be considered that more and more people in India are affected by it and the cases may increase. So, it is important to take into consideration about this disease as it may prove deadly one. And thus the intensity of this disorder can be lowered by diagnosing and taking proper treatments. Mainstream medicine currently does not have a vaccine. The vaccine when available would be stockpiled along with antiviral drugs for use to handle crisis emerging. However, immediately after the launch it



would be in short supply and ineffective, in a pandemic situation, for treating the masses in developing and underdeveloped nations. Besides the development of drug resistance, emergence of mutant strains of the virus, emergence of a more virulent strain, prohibitive costs of available drugs, time lag between vaccine development, and mass casualties would pose really difficult problems. In view of this, complementary and alternative medicine offers a plethora of interesting possibilities to help patients. Herbs exhibit a diverse array of biological activities and can be effectively harnessed for managing pandemic flu. It is evident that nutritional and botanical approaches, taken together, provide very potent tools for controlling an array of viral infections. It is unfortunate that many of these herbs have been overlooked, and the initial exciting research findings have not been followed up with larger, more rigorous clinical trials. The availability of a wide range of potentially active herbs and constituents, to potentiate as anti-influenza agents, may have a leading role in the ongoing struggle against the H1N1 infection. Herbal drugs would be useful, but it should not be expected as a panacea for offering perfect protection or absolute cessation of symptoms, but could be instead helpful in achieving reduced risk, symptom

reduction, and quicker recovery. This paper portrays an eclectic overview for the treatment of pandemic influenza and covers some of the herbs that are most likely to be of deal help in managing the current pandemic scenario .It is our firm belief that the plants discussed in the paper would also be useful in treating the patients with serious influenza in non pandemic situations too.

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