Formulation and evaluation of herbal tablet for treatment of swine flu

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***Abstract*: Swine flu is an infection caused by a virus. It's named for a virus that pigs can get. People do not normally get swine flu, but human infections can and do happen. In 2009 a strain of swine flu called H1N1 infected many people around the world. The virus is contagious and can spread from human to human. Symptoms of swine flu in people are similar to the symptoms of regular human flu and include fever, cough, sore throat, body aches, headache, chills and fatigue. There are antiviral medicines you can take to prevent or treat swine flu. There is a vaccine available to protect against swine flu. You can help prevent the spread of germs that cause respiratory illnesses like influenza by:**
Covering your nose and mouth with a tissue when you cough or sneeze. Throw the tissue in the trash after you use it. Washing your hands often with soap and water, especially after you cough or sneeze. You can also use alcohol-based hand cleaners.
Avoiding touching your eyes, nose or mouth. Germs spread this way. Trying to avoid close contact with sick people. Staying home from work or school if you are sick.

***Keywords*: Swine flu, H1N1 influenza, life- threatening, common flu**

Introduction:

Swine influenza is an infection caused by any of several types of swine influenza viruses. Swine influenza virus (SIV) or swine-origin influenza virus (S-OIV) is any strain of the influenza family of viruses that is endemic in pigs.[As of 2009, the known SIV strains include influenza C and the subtypes of influenza A known as H1N1, H1N2, H2N1, H3N1, H3N2, and H2N3.

Swine influenza virus is common throughout pig populations worldwide. Transmission of the virus from pigs to humans is not common and does not always lead to human flu, often resulting only in the production of antibodies in the blood. If transmission causes human flu, it is called zoonotic swine flu. People with regular exposure to pigs are at increased risk of swine flu infection.

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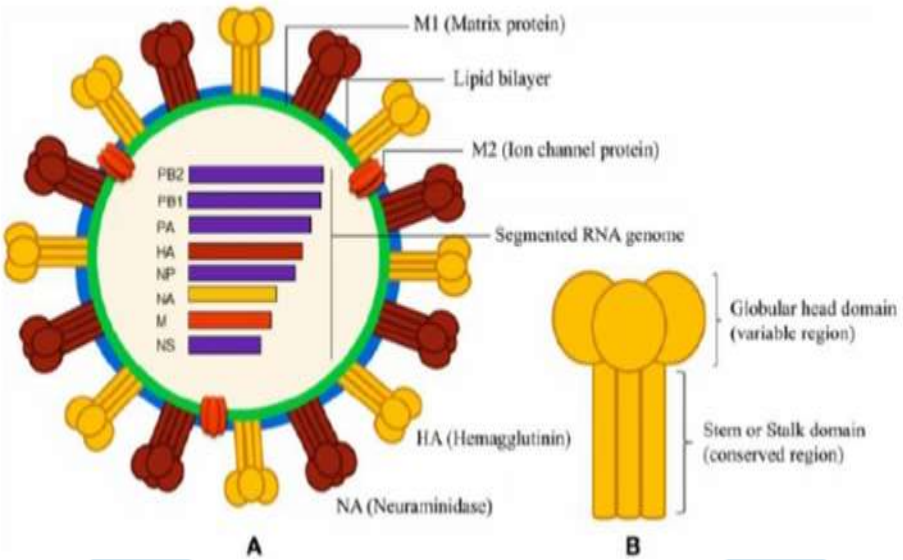
Around the mid-20th century, identification of influenza subtypes became possible, allowing accurate diagnosis of transmission to humans. Since then, only 50 such transmissions have been confirmed. These strains of swine flu rarely pass from human to human. Symptoms of zoonotic swine flu in humans are similar to those of influenza and of influenza-like illness in general, namely chills, fever, sore throat, muscle pains, severe headache, coughing, weakness, shortness of breath, and general discomfort

It is estimated that, in the 2009 flu pandemic, 11–21% of the then global population (of about 6.8 billion), or around 700 million to 1.4 billion people, contracted the illness—more in absolute terms than the Spanish flu pandemic. There were 18,449 confirmed fatalities. However, in a 2012 study, the CDC estimated more than 284,000 possible fatalities worldwide, with range from 150,000 to 575,000.the World Health Organization declared the swine flu pandemic officially over. Subsequent cases of swine flu were reported in India in 2015, with over 31,156 positive test cases and 1,841 deaths.

Pathophysiology:
Influenza viruses and the 2009 pandemic virus the influenza viruses are enveloped viruses with segmented negative stranded RNA genomes. They are classified in three genera – A, B and C.

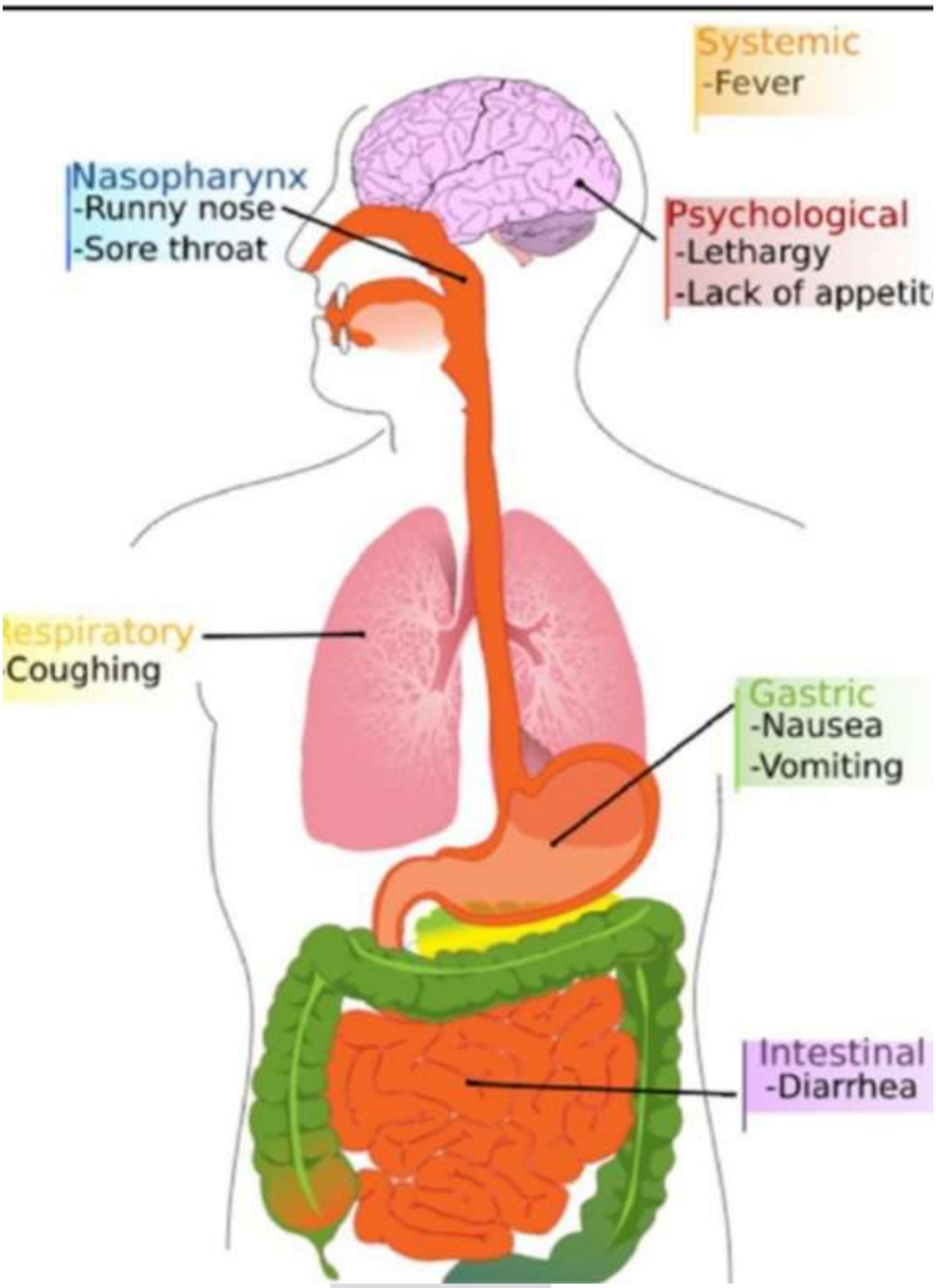
The influenza A viruses contain eight genome segments that encode ten different viral proteins, of which nine are part of the virus structure. These include the surface haemagglutinin (HA), neuraminidase (NA) and M2 ion channel proteins, the M1 matrix protein, the nucleocapsid protein (NP) that packages the RNA genome and the replication complex comprising the PA, PB1 and PB2 proteins



Symptoms:
The signs and symptoms of flu caused by the H1N1 virus are similar to those of infections caused by other flu strains and can include:

Fever, but not always
Chills
Cough
Sore throat
Runny or stuffy nose
Watery, red eyes
Body aches
Headache
Fatigue
Diarrhea
Nausea and vomiting

If you have emergency signs and symptoms of the flu, get medical care right away. For adults, emergency signs and symptoms can include:
Difficulty breathing or shortness of breath
Chest pain
Ongoing dizziness
Seizures
Worsening of existing medical conditions
Severe weakness or muscle pain
Emergency signs and symptoms in children can include:
Difficulty breathing
Blue lips
Chest pain
Dehydration
Severe muscle pain
Seizures
Worsening of existing medical conditions



Causes:
Influenza viruses such as H1N1 infect the cells that line your nose, throat and lungs. The virus enters your body when you inhale contaminated droplets or transfer live virus from a contaminated surface to your eyes, nose or mouth.You can't catch swine flu from eating pork.

Risk factor: If you live in or travel to an area where many people are infected with the H1N1 virus, you may be exposed to the virus.
Complication:Influenza complications include:
Worsening of chronic conditions, such as heart disease: and asthma
Pneumonia
Neurological signs and symptoms, ranging from confusion to seizures
Respiratory failure

Prevention:
The Centers for Disease Control and Prevention (CDC) recommends annual flu vaccination for everyone age 6 months or older.

Each year's seasonal flu vaccine protects against the three or four influenza viruses that are expectto be the most common during that year's flu season. The flu vaccine can reduce your risk of the flu and its severity and lower the risk of having serious illness from the flu and needing to stay in the hospital.
Flu vaccination is especially important in the 2020-21 flu season because the flu and coronavirus disease 2019 (COVID-19) cause similar symptoms. Flu vaccination could reduce symptoms that might be confused with those caused by COVID-19. Preventing the flu and reducing the severity of flu illness and hospitalizations

The flu vaccine is available as an injection and as a nasal spray. The nasal spray is approved for use in healthy people ages 2 through 49 years old. The nasal spray isn't recommended for some groups, such as pregnant women, children between 2 and 4 years old with asthma or wheezing, and people who have compromised immune systems.
These measures also help prevent the flu and limit its spread:
Wash your hands thoroughly and frequently. Use soap and water, or if they're unavailable, use an alcohol-based hand sanitizer.

Cover your coughs and sneezes. Cough or sneeze into a tissue or your elbow. Then wash your hands.
Avoid touching your face. Avoid touching your eyes, nose and mouth.
Clean surfaces. Regularly clean often-touched surfaces to prevent spread of infection from a surface with the virus on it to your body.
Avoid contact. Stay away from crowds if possible. Avoid anyone who is sick. If you're at high risk of complications from the flu — for example, you're younger than 5 or you're 65 or older, you're pregnant, or you have a chronic medical condition such as asthma — consider avoiding swine barns at seasonal fairs and elsewhere.

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.
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

2. Need and Objective
2.1 Need
Currently available synthetic drugs are having potential and resistance problem. Therefore the prospects for the control of H1N1 by existing anti-viral drugs are limited. It is troublesome, but there are lots of remedies, either to prevent a viral infection in the first place or to minimize the effects and shorten the duration. The herbal products today symbolize safety in contrast to the synthetics that are regarded as unsafe to human and environment.

2.2 Objective
1. Preparation and optimization of Herbal Swine Flu Tablets.
2. Performance evaluation of Herbal Swine Flu Tablets.
3. Plan of Work
1. Selection of drug and excipients
2. Procurement of drug and excipients

3. Extraction Process
4. Preparation of Herbal Swine flu tablets
5. Evaluation of tablets
6. Result and discussion
7. Conclusion
4. Material and Equipments
4.1 Materials
4.2 Equipments

Table 1: List of materials

Sr.No.	List of materials
1.	Giloy
2.	Neem
3.	Ginseng
4.	Tulsi (Bacilus)
5.	Ginger
6.	Clove
7.	fenugreek

Table 2: List of Equipments

Sr. no.	Name of the equipments
1.	Digital Electronic balance
2.	Monsanto hardness tester
3.	Friability test apparatus
4.	KBr Press
5.	Hot air oven
6.	Environmental test chamber
7.	Centrifuge apparatus
8.	Soxhlet Apparatus
9.	Vernier Caliper

Material & Method

Taxonomical classification ofNeem

•Kingdom:Plantae
•Clade:Tracheophytes
•Clade:Angiosperms
•Clade:Eudicots
•Clade:Rosids
•Order:Sapindales
•Family:Meliaceae
•Genus:Azadirachta indica

Neem Extraction: Oil extraction
Neem seeds were extracted using two solvent (n-hexane and ethanol) for 3 hours with ratio Neem seed powder weight to solvent volume of 1:5. In certain time intervals, the samples were taken and centrifuged to separate the solid fraction from solution. Filtrate was heated and evaporated to obtain solvent-free oil. Then the oil was weighed to calculate the concentration of oil in the solution. Extractions were conducted at 5 temperature level (30, 35, 40, 45, 50)

Taxonomical classification of giloy

Kingdom:Plantae
Clade:Tracheophytes
Clade:Angiosperms
Clade:Eudicots
Order:Ranunculales
Family:Menispermaceae
Genus:Tinospora
Species:T. cordifolia
Binomial name:Tinospora cordifolia

•Plant collection and extraction of Giloy:
The formulation of Giloy Satva collected from market and fresh part of the (Curculigo Orchioides).The powder of rhizomes was

extracted by Maceration using Hydro alcoholic mixture for 72 hours. This extract was concentrated under vacuum and then subjected to preliminary photochemical screening

Taxonomical classification of Tulsi:

•Kingdom:Plantae
•Clade:Tracheophytes
•Clade:Angiosperms
•Clade:Eudicots
•Clade:Asterids
•Order:Lamiales
•Family:Lamiaceae
•Genus:Ocimum

•Species:O. tenuiflorum
•Binomial name:Ocimumtenuiflorum

Tulsi Ayurveda is the system of traditional medicine first practiced in ancient India. It traces its origins to the Veda scripts. It is based on the belief that the balance between the five elements has to be maintained. The elements are grouped together to form three doshas that help to classify all individual constitutions of people, diseases, herbs and other non-herbal remedies and therapies

The doshas are Vata (air or nerve oriented), Kapha (water or mucoid type) or Pitta (fire type). Ocimum tenuiflorum (synonym Ocimum sanctum), commonly known as holy basil, tulasi (sometimes spelled thulasi) or tulsi, is an aromatic perennial plant in the family Lamiaceae which is native to the Indian subcontinent and widespread as a cultivated plant throughout the Southeast Asian tropics.Tulsi is cultivated for religious and medicinal purposes, and for its essential oil. It is widely known across the Indian subcontinent as a medicinal plant and a herbal tea, commonly used

it is not to be confused with Thai basil, which is a variety of Ocimum basilicum. Ocimum is a genus of aromatic annual and perennial herbs and shrubs in the family Lamiaceae. Its best known species are the cooking herb Cooking basil, O. basilicum

and this medicinal herb Tulsi (holy basil), O. tenuiflorum. Most culinary and ornamental basils are cultivars of Ocimum basilicum

Tulsi (Sanskrit:-Surasa) has been used for thousands of years in Ayurveda for its diverse healing properties. It is mentioned in the Charaka Samhita, an ancient Ayurvedic text. Tulsi is considered to be an adaptogen, balancing different processes in the body, and helpful for adapting to stress. Marked by its strong aroma and astringent taste, it is regarded in Ayurveda as a kind of "elixir of life" and believed to promote longevity. Tulsi extracts are used in ayurvedic remedies for a variety of ailments. Traditionally, tulsi is taken in many forms: as herbal tea, dried powder

taken in many forms: as herbal tea, dried powder, fresh leaf or mixed with ghee. Essential oil extracted from Karpoora tulasi is mostly used for medicinal purposes and in herbal cosmetics. Ayurveda, the traditional 'science of life', has a remedy for diseases when every other stream of medicine fails. Now, at a time when swine flu is spreading like wildfire across the

Ayurveda has the remedy in the form of the miraculous herb, the basil leaves commonly known as Tulsi. Wonder herb Tulsi, the purest and most sublime plant, has been known and worshipped in India for more than five millennia for its remarkable healing properties. Considered as an 'Elixir of Life', this wonder herb has now been claimed to keep the deadly swine flu at bay and help fast recovery in afflicted persons.

Tulsi or holy basil is revered and worshipped throughout India for its amazing medicinal properties. It is known to:

a) Relieve stress

b) Strengthen the immune syste

c) Enhance stamina

d) Relieve congestion and colds

e) Promote healthy metabolism

f) Relieve inflammation

g) Lower cholesterol

h) Provide rich supply of antioxidants

Taxonomical classification of clove:

•Kingdom:Plantae
•Clade:Tracheophytes
•Clade:Angiosperms
•Clade:Eudicots
•Clade:Rosids
•Order:Myrtales
•Family:Myrtaceae
•Genus:Syzygium

•Species:S. aromaticum

Extraction of clove:
100gm of ground clove (Myratacae) was followed by 1litres of 40% ethanolto extract the phenolic compounds and sugars. The ethanol extract was concentrated on a evaporator and extracted three times with ethyl acetate to remove the phenolic compounds andpolar organics. Finally the remaining ethanol solution was extracted three times with ethyl ether to remove the nonpolar organic compounds

Taxonomical classification of ginger:

•Kingdom:Plantae
•Clade:Tracheophytes
•Clade:Angiosperms
•Clade:Eudicots
•Clade:Rosids
•Order:Fabales
•Family:Fabaceae
•Subfamily:Faboideae
•Genus:Trigonella
•Species:T. foenum-graecum

•Binomial name:Trigonella foenum-graecum

Ginger (Zingiber officinalis)Zingiber officinalis is one of the natural remedies forswine flu prevention. It boosts the body's immunity leveland helps protect the body. The characteristic odor andflavor of ginger root is caused by a mixture ofzingerone, shogaols, and gingerols, volatile oils thatcomprise of about one to three percent of the weight offresh ginger. It boosts the body's immunity level andhelps protect the body. Ginger has been known to fightcold, fever and flu conditions, and is also good to reduceinflammation. Ginger root, which has anti-nausea andanti-inflammatory effects and also aids digestion.

Fresh clean, rhizomes of Z. officinale (Specimen diced into fine pieces, air-dried and ground to a fine powder. The Z. officinale powder was added into sterile double-
distilled water in a then boiled for the 20 min.
Zingiber officinale aqueous plant extract was prepared and filtered through Whatman filter paper and the filtrate was characterized with the help of FTIR. The plant extract was stored in a refrigerator after proper labeling.

Taxonomical classification of of fenugreek:

•Kingdom:Plantae
•Clade:Tracheophyte

•Clade:Angiosperms
•Clade:Eudicots
•Clade:Rosids
•Order:Fabales
•Family:Fabaceae
•Subfamily:Faboideae
•Genus:Trigonella

•Species:T. foenum-graecum
•Binomial nameTrigonella foenum-graecum

Extraction of fenugreek:

Seed fenugreek 10 mg The was prepared powder dissolved in distilled water (DW) and adjusted to 1.5 mg/mL (the concentration was based on the residual amount of RG extract). The preparation was centrifuged at for 10 min and fi ltered through a cellulose membrane (0.22 µm pore size; was dissolved in DW and adjusted to 1 mg/mL The prepare further diluted with DW in each ex-periment

Taxonomical classification of ginseng:

•Kingdom:Plantae
•Clade:Tracheophytes
•Clade:Angiosperms
•Clade:Eudicots
•Clade:Asterids

•Order:Apiales
•Family:Araliaceae
•Genus:Panax
•Species:P. ginseng
•Binomial name:Panax ginseng

Use of ginseng:

. Taking a specific Panax ginseng by mouth appears to reduce the risk of getting a cold or the flu. But, taking Panax ginseng does not seem to reduce flu symptoms or the length of the illness

Evaluation of test:

1.Weight variation test Twenty tablets from each formulation were selected at random and average weight was determined. Then the individual tablets were weighed and were compared with average weight. Not more than 2 of individual weight deviate by more than percentage while none deviates by more than twice that percentage

Evaluation of Herbal Tablets

Formulation	Diameter (mm)	Thickness (mm)	Hardness (kg/cm2)	Weight Variation (mg)
HST 1	13.12 ± 0.145	3.15 ± 0.01	4.1	462.30 ± 0.161
HST2	13.15±0.173	3.31±0.021	4.3	468.13±0.098
HST-3	13.17±0.251	3.35±0.017	4.5	471.23±0.224
HST-4	13.20±0.284	3.51±0.036	4.9	486.02±0.192
HST 5	13.19±0.392	3.40±0.029	4.6	482.32±0.346

*All readings are average ± SD (n=3)

Sr.No.	Dosage form	average weight	%deviation
1.	Uncoated	80mg Or less	10
2.	Film coated	>80 mg less250mg	7.5
3.	Tablet	less250mg	5

2 .Hardness Test

After preparation of matrices, primary micrometric properties are measured like, Tablet thickness, diameter, weight &hardness. Thickness & diameter is measured by using Vernier caliper, hardness is determined by using Monsanto hardness tester. Tablet hardness is defined as the force required breaking a tablet in a diametric compression force. It is also known as tablet crushing

strength. The hardness tester used in the study was Monsanto Hardness Tester, which applies the force to the tablet diametrically with the help of an in built spring. The tester was initially adjusted to zero [24].

3. Diameter and thickness

Diameter and thickness was performed by using digital Vernier caliper. Results for all the batches of herbal tablets were reported.

4. Friability test

Friability test is performed to assess the effect of friction and shock that may often cause tablet to chip, cap, or break. Roche's friabilator was used for the purpose. Compressed tablets should not lose more than 1% of their weight (as per IP It is the phenomenon whereby tablet surfaces are amaged and/or show evidence of lamination or breakage when subjected to mechanical shock or attrition. The friabilityof tablets was determined by using Roche's Friabilator. It is expressed in percentage (%). Ten tablets were initially weighed (W initial) and transferred into Friabilator. The friabilator was operated at 25 rpm for 4 minutes or run up to 100 revolutions. The tablets were weighed again (W final). The percentage friability was then calculated by
(% Friability of tablets less than 1% is considered acceptable)

Formulation	Friability (%)
HST 1	0.095 ± 0.007
HST 2	0.126 ± 0.003
HST3	0.089 ± 0.002
HST4	0.072 ± 0.006
HST5	0.274 ± 0.008

Evaluation of herbal tablet:

Diameter, thickness, hardness and weight variation The results of diameter, thickness, hardness and weight variation for all the batches of herbal tablets

Summary:

Some key findings from my research project are:

· Extraction of ginger fenugreek ,ginsengng , Clove and Neem tulsi giloy was carried out successfully.

· Characterization and identification of all herbal excipients was done.

· The Herbal tablets were prepared by direct compression method.
· Post compression study like Hardness, Thickness, Diameter, Friability and Weight variation of tablet is carried out.

Conclusion:
According to Ayurveda, swine flu is placed under a class of diseases called Sannipatajjvar. Sannipatajjvar is basically triggered by an aggravation of the three Doshas (Vata, Pitta &Kapha) and a loss of Ojas in the body. Low Ojas is lack of immunity at the physical level and absence of mental strength
at the mind level. By strengthening the Ojas you can easily prevent diseases like swine flu from attacking. Now days it has necessary that turn attention towards herbal therapy. The proposed project of formulating Herbal Swine Flu tablets by the addition of excipients and compressing it into a tablet dosage form as an attempt to minimize side effect as well as to improve immunoefficiency caused by H1N1 influenza virus. In another way, shorten the duration of infection. So, this herbal tablets useful as immune enhancer also useful as disease resistance. These tablets have the potential to be optimized for the, simplicity and cost effectiveness. Herbal tablets are prepared by direct compression method was evaluated successfully.

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