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FORMULATION AND EVALUATION THE SPINACH POWDER FOR THE TREATMENT OF ASTHMA

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ABSTRACT

Inflammation of the respiratory tract is a crucial process in immune disease including asthma and atopic Rhinitis.To establish whether an aqueous extract of spinacia oleracea linn (SoL) has a beneficial influence In terms of anti-asthmatic activity.

Man is said to be a frugivorous human and a frugivorous human is generally defined as one that lives on Fruits (which will include vegetables). There are many weighty reasons for according a preeminent position To leafy vegetaables in the human dietetics. The leaf,so to say, is the laboratory of the plant. Almost every- Thing that is needed by different parts of the plant is manufactured here. Scientifically it is known as spincia Oleracea Linn.(Family-Chenopodiacea).The spinach used as a food and has medicinal value also.

Spinach bundled up with vitamins such as vitamin A, vitamin B, Vitamin C, Vitamin E and minerals like Magnesium, Manganese, Iron, calcium and folic acid. Spinach is great source of chlorophyll, which speed up Digestion.

KEYWORDS:- *Spinacia Oleracea Linn;, Asthma;, Inflammation*

INTRODUCTION

Asthma

- The word "asthma" originates from the Greek meaning short of breath, meaning that any patient with breathlessness was asthmatic.
- The term was refined in the latter part of the **19th Century** with the publication of a treatise **by Henry Hyde Salter entitled "On Asthma and its Treatment"**.
- It is a disease affecting the airways that carry air to and from lungs.
- People who suffer from this chronic condition (long-lasting or recurrent) are said tobe asthmatic.
- The inside walls of an asthmatic's airways are swollen or inflamed.
- swelling or inflammation makes the airways extremely sensitive to irritations and increases the susceptibility to an allergic reaction.
- Astham is a common chronic inflammatory disorder of the airways that is characterized by variable and recurring symptoms, airflow obstruction, bronchial hyper-responsiveness, and underlying inflammation.

What is Asthma?

Define: Asthma is a chronic inflammatory disorder of the airways that is characterized by recurrent episodes of wheezing, breathlessness, chest tightness, and coughing'.

Asthma is a condition that affects the airways that carry air in and out of your lungs.

When you have asthma, the lining of these airways can become inflamed, which makes them swell up and produce excess mucus.

The airways can become narrower because of this, which makes it harder to breathe.

The symptoms can be triggered by many different allergens as well as by other things such as stress and exercise.

Asthma is a chronic condition, which means that it lasts for a long time and usually for life.

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Fig 1 Asthma Image

SYMPTOMS

- Asthma signs and symptoms include:
- Asthma symptoms vary from person to person :
- Shortness of breath.
- Chest tightness .
- Wheezing when exhaling, which is a common sign of asthma in children.
- Coughing .
- wheezing attacks that are worsened by a respiratory virus, such as a cold or the flu.
- Tachycardia due to that increase in heart rate .
- Dyspnea in which suffocation in breathing.
- Pain during breathing.

CAUSES OF ASTHMA

Family History.

If you have a parent with asthma, you are three to six timesmore likely to develop asthma than someone who does not have a parent with asthma.

ALLERGIES

- Viral respiratory infections.
- Occupational exposures.
- Smoking.
- Air Pollution.
- Obesity.
- Fatty foods.
- Dusts.
- Pets.
- Bacteria and Viruses.
- Genetics.

Types of Asthma: Several types of asthma that are described below-

1. Allergic asthma.
2. Seasonal asthma.
3. Occupational asthma.
4. Non-allergic asthma.
5. Exercise-induced asthma.
6. Difficult asthma.
7. Severe asthma.
8. Brittle asthma.
9. Childhood asthma.
10. Adult onset asthma

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Allergic Asthma
Allergic asthma, sometimes called atopic asthma, is asthma triggered by allergens like pollen, pets, and dust mites. About 80% of people with asthma have allergies.

Seasonal Asthma
Some people have asthma that only flares up at certain times of the year, such as during hay fever season, or when it's cold is known as seasonal asthma.

Occupational Asthma:
Occupational asthma is caused by breathing in substances at work, like dust, chemicals, fumes and animal flue.
Occupational asthma can be caused by many things.

For example, if you work in a bakery, flour dust could trigger symptoms, or if you work in healthcare, latex might be a trigger.

Non-Allergic Asthma
Non-allergic asthma, also known as non-atopic asthma, is asthma that isn't related to an allergy trigger like pollen or dust. It's less common than allergic asthma. Non-allergic asthma often develops later in life.
If your asthma does not seem to be triggered bythings like pollen, dust mites or pets, you might have non- allergic asthma.

Exercise-Induced Asthma
About 90% of people with asthma have tightening of the airways caused by exercise. However, this can also occur in people without asthma.

If you don't have a diagnosis of asthma, but you're getting symptoms like a tight chest, breathlessness, coughing, or fatigue during or after exercising, see your GP. They can:

Test your lung function with a spirometer test. This is to make sure you don't have asthma.

Spirometer is the most common type of pulmonary function or breathing test. This test measures how much air you can breathe in and out of your lungs, as well as how easily and fast you can the blow the air out of your lungs

Fig. 3 Spirometer

Difficult Asthma
About 17% of people with asthma have what's known as difficult asthma or difficult-to-control asthma.

- You may have difficult asthma if:
- you get symptoms three or more times a week.
- you use your reliever inhaler three or more times a week .
- you wake up at night because of your asthma one or more times a week .

Severe Asthma
About 4% of people with asthma have what's known as severe asthma. Severe asthma is usually diagnosed and treated in a specialist asthma clinic.

Severe asthma is a type of difficult asthma that doesn't respond to the usual treatments. Even if your asthma is described as 'difficult' and you're having lots of asthma attacks, it doesn't always mean you have severe asthma

Brittle Asthma
The old-fashioned term brittle asthma is sometimes still used to describe difficult and severe asthma

Childhood Asthma
Asthma affects around 1.1 million children in the UK.
Some children diagnosed with asthma find it improves or disappears completely as they get older. This is known as childhood asthma.

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However, it can sometimes return later in life.

Adult Onset Asthma

Asthma often starts in childhood, but some people are diagnosed with asthma for the first time when they're an adult. This is known as adult onset asthma or late onset asthma.
Some of the possible causes of adult onset asthma are: smoking obesity

LITRATURE REVIEW

1) William Brett Perkinson., et.al (2023)

From these review of adult asthma I taken and study about the introduction of asthma Include the asthma is a chronic inflammatory disorded.The wall of asthmatic airway's are swallow. He give detailed study about the chronic asthma.

2) Abbaraju Krishna Saillaja., et.al (2020)

From these overall review on chronic asthma the causes of asthma are taken and studied. Asthma is a heterogeneous group of conditions that result in recurrent, reversible bronchial obstruction. Although the disease can start at any age, the first symptoms occur during childhood in most cases. Asthma has a strong genetic component, and genome-wide.

3) Robert T. M.C. Master., et.al(2021)

From these also take some part of introduction. Asthma is a common chronic inflammatory disorder of the airways that is characterized by variable and recurring symptoms, airflow obstruction, bronchial hyper- responsiveness, and underlying inflammation.

4) Akinbami Fly., et. al(2020)

From these I take the symptoms of asthma like shortness of breath, chest pain etcShortness of breath, Chest tightness ,when exhaling, which is a common sign of asthma in children, Coughing ,wheezing attacks that are worsened by a respiratory virus, such as a cold or the flu.,Tachycardia due to that increase in heart rate
,Dyspnea in which suffocation in breathing, Pain during breathing.

5) Dr. Ramesh Tewani Et.al:-(2016)

Spinach also called as "Life Protective Food". Spinach has therapeutic action on each and every system. Spinach protects our life from cradle to grave as development of fetus in womb to degeneration in old age.Spinach gives it's love and affection at every stage of life like a mother. Though we can't count their precious and uncountable benefits on finger tips but some unforgettable benefits in today's wrong lifestyle disorders are Diabetes, Hypertension, Heart diseases, Obesity, Blindness, Osteoporosis, Anemia, Constipatio nand many more.

AIM AND OBJECTIVES

Aim

To formulate and Evaluate the Spinach Powder For The Treatment of Asthma

OBJECTIVES OF SPINACH

- From Spinach powder increased the Vitamin K and vitamin C level in the Asthmatic Patients .
- Spinach is rich in many nutrients, including vitamin A, vitamin C, vitamin K, iron, folate, and potassium.
- With the help of Spinach , cancer prevention and regulate blood sugar in the body .
- Spinach is a superstar among green leafy vegetables.
- Keeps Eyes Healthy.
- Spinach is an all-rounder healthy food; it contain beta-carotene also.
- Studies have shown that all above nutrients are responsible for reducing the chances of asthma attacks.

OBJECTIVES OF ADULSA

- Vasaka is also known as Malabar nut.
- A crucial plant drug in ancient Ayurveda and Unani medicine.
- It used in the preparations of herbal medications for the past 2000 years.
- The Vasaka plant is a small, evergreen shrub with green leaves and white flowers.
- With an unpleasant smell and bitter taste.

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PLANT PROFILE
SPINACH INFORMATION

Fig 4 Spinach Image

Synonyms :Spinach plant,green,spinach plant ,etc.
Biological Name :Spinacia oleracea L.
Family: Amaranthaceae.
Chemical Constituents: Vitamin A, Vitamin C, Vitamin K, Magnesium (79mg per100g), Manganese, Iron(2.7mg per 100g), Folate(194μg per 100g), Vitamin B, Vitamin E, Calcium (99mg per100g.), Potassium, Chlorophylls , Phenolic compounds , beta-carotene, etc.
Lifespan :Usually 6-10 weeks.
Uses

- Prevents asthmatic attack.
- Prevents cancer.
- Reduced blood sugar level.
- Good for eyes.
- Reduced hypertension.
- Has Anti-inflammatory properties.
- your body relaxed.
- Boosts your immunity.
- Glowing skin.
- Prevent acne.

Precaution: Spinach contain high amount of calcium it combine with oxalic acid and form oxalate of calcium that may cause stones in the kidney.
Foods avoids with asthmatic patients :

- Eggs
- Soy
- Cow's milk
- Wheat

Mechanism of Action Spinach Powder

- Spinach is an all-around healthy food; for asthmatics, the presence of beta-carotene, vitamin E, vitamin C and magnesium makes it a vital item for your food plate.
- Studies have shown that these nutrients are responsible for reducing the chances of asthma while providing a host of other health benefits.
- Spinach powder is a great way to lower cholesterol levels.

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- Spinach contains high amounts of fiber and Omega-conjugated linoleic acid (CLA), which has been shown that it can help reduce the risk of cardiovascular disease by lowering LDL or "bad" cholesterol in our body.

Mechanism action of Adulsa powder

- Adulsa is an ancients Ayurvedic medicine used for the prevention on asthma. Vasaka leaves may contain two major alkaloids vasicinone and vasicine.
- Studies by Shivendra Pratap Singh and Das in 2021 found that vasaka might have activity againt respiratory disorders such as athma and bronchiti.
- It may have bronchodilatory properties which open airway passage of lungs. It may liuify the thick and sticky sputum , helps to expel it quickely

PLAN OF WORK

Herbal Formulation Of Spinach .
Step1:Buy or harvest 2 to 3 pounds of fresh spinach leaves. Place the leaves into a large bowl or plastic container.
Fill the container with cold water and repeatedly rinse until the water runs clear. Drain the leaves well.
Step 2: Dehydrate the spinach .(removal of water)
Step 3: Once you have the dried spinach you will need to grind it into a fine powder. Remove any thick stems from the spinach leaves before packing them into the bowl of a spice grinder.
Step 4: Place the lid on the grinder and pulse until the spinach leaves have been ground into a fine powder. Gently tap the spice grinder on the table top to allow the fine powder to settle before removing the lid.
Step 5: Transfer the fine spinach powder to a container with a tight fitting lid. Store the powder in a cool dark cabinet out of direct light.

Formulation of Adulsa Powder

Now these plant is not available in environment , so it buy from the herbal medicinal companies like patnjali ayurvedic place .
Various other ayurvedic companies are available like pantajli dhut papeshvar , vaidhynath etc. Place in dry places for avoiding microbial contamination.
How make the ginger tea:
Step 1: Wash and scrub your ginger.
Step 2: Peel ginger and slice thinly.
Step 3: Pours two cups drinking water into a pot.
Step 4 : Place the ginger slice into the water and boil it about 10 to 20 minutes.
Step 5: Remove from heat and cool it .

GINGER INFORMATION

Synonyms :Adrak,zenziro (italic) **Biological name** :Zanzibar Officinal Roscoe. **Family**:Zinziberaceae.
Chemical Constituents: Zinzerol, Citral,Zinziberene,Shagoal,Elemol,Zinziberol.

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Adulsa Information

Synonym: Adhatoda vasica ,Adulsa, Vasaka ,Malabar nuts .
Biological Source : Southeast Asia and the India.
Chemical constituents : Alkaloids such as vasicine, vasicinone, and deoxyvasicine. Other constituents include essential oils, flavonoids, and tannins
Uses : Expectorant Bronchodilator, Antimalarial properties.
Also treat respiratory ailments such as coughs, bronchitis, and asthma.

Additionally, it has been studied for its potential anti-inflammatory and anti-cancer properties.
Method And Equipment
The easiest possible way to consume the powder is to add 1 tsp of it in a glass (250 ml) ofwater and stir as an instant drink.
If you want to take your drink to a next level, consider adding fresh tomato, mint, cucumber juice to it. You may also think of adding any other fresh fruit juice like pineapple, watermelon, mosambi, lemon to it for better taste.
You may add a few drops of ginger juice to it for a special punch.
You may also try to add it while making dough for roti/ paratha or in the idli/ dosa batter. You can also think of adding it to your dal or vegetables.

PROCEDURE

1. Collect the fresh spinach leaves from avilable site and wash it with fresh cold water in a bowel.
2. Dry it properly in cloth or sunrise. Dehydration of your spinach .
3. After you need a grinder for grinding purpose of spinach leaves .Then your fine powder is form with uniform size.
4. Collect the powder in bowel , feel in container . These container must pack tightly with lid.
5. And finally store the powder in dark pace. Avoid the moist place due to that chances of
6. Microbial Contamination.
7. Spinach Leaves are collect from market .
8. Dry it well in the presence of sumraise.
9. After drying grind it in morter pestle but for better fine powder I use grinder.
10. With the help of it very fine powder is obtained .(i.e size of spinach powder 0.15 to 0.50µm.
11. Take the Adulsa powder from market that is available in Ayurvedic store
12. Now these plant are not available in an environment so buy from Ayurvedic store
13. Mix well both powder that is spinach powder and Adulsa powder in morter and pestle
14. .And finally fill these powder in pouch.

EVALUATION
Particle size :Particle size is determined by the Dynamic Light Scattering Technique. Mostly the size of spinach leaves is measured in Nano- or micro-meter.
1 micrometer = 1000 nanometer .
The average size rang of spinach leaves is 0.15 to o.50μm.
Increase the particle size significantly affect in bulk density. The particle size of spinach powder is

Density: Mass of a unit volume of material substance. Formula: 1. D=M /V 2. M=D×V 3. V=M/D .

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According to formula = 16/30=0.533mg/ml.

Bulk density : mass of dry powder in gm./mass of dry powder in ml. Mass of powder in gm.=16gm Mass of powder in ml=32

Angle of Repose
Height pile in cm=4cm
Average radius of circle in cm=5.5 Angle of repose(Ø)=$\tan^{-1}(h/r)$.
According to formula=$\tan^{-1}4/5.5$

Nature : Spinach leaves powder is Amorphous in nature like daily use cosmetic powders.
Color: Khaki or Dark khaki.
Odour :Pleasant aroma.
Taste : slightly sweet.
Solubility :Solubility is the ability of a solid, liquid or gaseous chemical substance to dissolve in solvent and form solution.

Tap density: mass of powder/Tapped volume.
Mass of powder=16 gm Tapped volue=41ml
According to formula = 16/41=0.39gm/ml.

Bulk density : mass of dry powder in gm./mass of dry powder in ml. Mass of powder in gm.=16gm Mass of powder in ml=32ml
According to formula =16/32=0.5gm/ml

Angle of Repose
Height pile in cm=4cm
Average radius of circle in cm=5.5 Angle of repose(Ø)=$\tan^{-1}(h/r)$.
According to formula=$\tan^{-1}4/5.5$
Nature :Spinach leaves powder is Amorphous in nature like daily use cosmetic powders.
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Solubility :Solubility is the ability of a solid, liquid or gaseous chemical substance to dissolve in solvent and form solution.

RESULT

Here the new combination that is you can intake with ginger tea. The evaluation was performed by studying it's physical characteristics like particle size, odor, colour,texture,density etc,its chemical properties also.The particle is measured in $0.15\mu m\ to\ 0.50\mu m$ .The Density of spinach powder is found to be 0.533mg/ml.And also find out the bulk density that is 0.5gm/ml.From all the evaluation parameters I done my project succesfully.And I say to its beneficial to all persons that are suffering from asthmatic conditions or symptoms

CONCLUSION

From above data I conclude that has maximum benefits .It includes both powder that have synergestic effects. Spinach powder have multivitamins and adulsa have bronchodilator capacity.These herbal product was buy any person .The cost is low due to it's high avaibility.So I can conclude that herbal product is best product than others synthetics medicines because of these powder provides various phytoconstituents which are never include in our daily diet. This powder can be ideal for the obesety ,diabetic patients face problems etc. So finally I conclude that this powder can help your asthma problems and maintained your immunity for healthy lifestyle with one spoon of spinach powder

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