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Preparation and Evaluation of Herbal Effervescent Granules for Anorexia Nervosa

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ABSTRACT:
Anorexia nervosa often simply called anorexia is an eating disorder characterized by an abnormally low body weight, an intense fear of gaining weight and a distorted perception of weight. People with anorexia place a high value on controlling their weight and shape, using extreme efforts that tend to significantly interfere with their lives. To prevent weight gain or to continue losing weight, people with anorexia usually severely restrict the amount of food they eat. They may control calorie intake by vomiting after eating or by misusing laxatives, diet aids, diuretics or enemas. They may also try to lose weight by exercising excessively. No matter how much weight is lost, the person continues to fear weight gain. Anorexia isn't really about food. It's an extremely unhealthy and sometimes life-threatening way to try to cope with emotional problems. When you have anorexia, you often equate thinness with self-worth. Anorexia, like other eating disorders, can take over your life and can be very difficult to overcome. But with treatment, you can gain a better sense of who you are, return to healthier eating habits and reverse some of anorexia's serious complications. The prevalence of obesity is increasing worldwide. Bioactive phytochemicals in food supplements are a trending approach to facilitate dieting and to improve patients' adherence to reducing food and caloric intake. The aim of this systematic review was to assess efficacy and safety of the most commonly used bioactive phytochemicals with appetite/hunger-suppressing and/or satiety/fullness-increasing properties. To be eligible, studies needed to have included at least 10 patients per group aged 18 years or older with no serious health problems except for overweight or obesity. Of those studies, 32 met the inclusion criteria, in which 27 different plants were tested alone or as a combination, regarding their efficacy in suppressing appetite/hunger and/or increasing satiety/fullness.

KEYWORDS: Bioactive phytochemicals, plant extracts, appetite, hunger, satiety, fullness.

INTRODUCTION:

The term "medicinal plant" includes various types of plants used in herbalism ("herbology" or "herbal medicine"). It is the use of plants for medicinal purposes, and the study of such uses. The word "herb" has been derived from the Latin word, "herbal" and an old French word "here". Now a days, herb refers to any part of the plant like fruit, seed, stem, bark, flower, leaf, stigma or a root, as well as a non-woody plant. Earlier, the term "herb" was only applied to non-woody plants, including those that come from trees and shrubs. These medicinal plants are also used as food, flavonoid, medicine or perfume and also in certain spiritual activities. Plants have been used for medicinal purposes long before prehistoric period.

Ancient Unani manuscripts Egyptian papyrus and Chinese writings described the use of herbs. Evidence exists that Unani Hakims, Indian Void's and European and Mediterranean cultures were using herbs for over 4000 years as medicine. Indigenous cultures such as Rome, Egypt, Iran, Africa and America used herbs in their healing rituals, while other developed traditional medical systems such as Unani, Ayurveda and Chinese Medicine in which herbal therapies were used systematically. Traditional systems of medicine continue to be widely practised on many accounts. Population rises, inadequate supply of drugs, prohibitive cost of treatments, side effects of several synthetic drugs and development of resistance to currently used drugs for infectious diseases have led to increased emphasis on the use of plant materials as a source of medicines for a wide variety of human ailments. Among ancient civilisations, India has been known to be rich repository of medicinal plants. The forest in India is the principal repository of large number of medicinal and aromatic plants, which are largely collected as raw materials for manufacture of drugs and perfumery products. About 8,000 herbal remedies have been codified in AYUSH systems in INDIA. Ayurveda, Unani, Siddha and Folk (tribal) medicines are the major systems of indigenous medicines. Among these systems, Ayurveda and Unani Medicine are most developed and widely practised in India. Recently, WHO (World Health Organization) estimated that 80 percent of people worldwide rely on herbal medicines for some aspect of their primary health care needs.

According to WHO around 21,000 plant species have the potential for being used as medicinal plants. As per data available over three quarters of the world population relies mainly on plants and plant extracts for their health care needs. More than 30% of the entire plant species, at one time or other were 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 India and China, 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. Treatment with medicinal plants is considered very safe as there is no or minimal side effects. These remedies are in sync with nature, which is the biggest advantage.

REVIEW OF HERBS USED:

Figure 1 Ajwain

Figure 3 Cumin

Figure 2 Black Pepper

Figure 4 Asafoetida (Hing)

Figure 5 Sunth

Figure 6 Pippali

Ajwain: Nowadays there are a variety of new drugs available in the market and the use of drugs is also increasing day by day, which causes a lot of toxicity in the human body, hence it is necessary to promote natural ingredients or foods as drugs to minimize the toxicity of the drugs in the body. Trachyspermum Ammi (Ajwain) is a natural spice which is very beneficial and shows a variety of pharmacological functions. Almost all the parts of Ajwain play different pharmacological actions. The oil of Ajwain seed contains a component named turmoil which is very beneficial. Ajwain shows actions like diuretic, antihypertensive, Antispasmodic, antilatent, anthelminthic, antiplatelet, bronchodilation, antiulcer, antitussive, analgesic, hepatoprotective and other activities so it is necessary to investigate these types of natural products and to provide safe and effective medications to human race. These Superfoods may also have many hidden properties; hence it is necessary to study Ajwain and its constituent. [13,14]

Black pepper: Black pepper (Piper nigrum L.) is such a useful medicinal plant that black pepper is called the "king of spices". Black pepper is used throughout the world for various types of dishes. Black pepper is also used in medicine for multiple types of diseases since centuries ago. Black pepper is useful in treatment, preservatives, and flavourings, the cosmetic industry, the perfume industry and is widely used as a medicinal ingredient, both in a single form and in mixed conditions with other components. In Indonesia, pepper (Piper nigrum L.) is used as an antimicrobial, antihypertensive, anti-plasma, anti-inflammatory, hepatoprotective and antioxidant.[18,19]

Cumin: Cuminum cyminum and Carum carvi, belonging to the family Apiaceae, are one of the earliest cultivated herbs in Asia, Africa and Europe. Cumin and caraway seeds from Cu. cyminum and Ca. carvi, respectively, have remained popular as culinary spices and are also overwhelmingly used in folklore therapy since antiquity in diverse geographical areas.[25,26,27]

Hing: Ferula asafoetida is herbaceous plant of the Umbelliferae family. It is oleo gum resin obtained from the rhizome and root of plant. This spice is used as a digestive aid, in food as a condiment and in pickles. It is used in modern herbalism in the treatment of hysteria, some nervous conditions, bronchitis, asthma and whooping cough. It was at one time employed in the treatment of infantile pneumonia and flatulent colic. The gum resin is antispasmodic, carminative, expectorant, laxative, and sedative. The volatile oil in the gum is eliminated through the lungs, making this an excellent treatment for asthma. The odour of asafoetida is imparted to the breath, secretions, flatus, and gastric eructation. Its properties are antispasmodic, expectorant, stimulant, emmenagogue and vermifuge. Asafoetida has also been used as a sedative. It also thins the blood and lowers blood pressure. It is widely used in India in food and as a medicine in Indian systems of medicine like ayurveda. Asafoetida has been held in great esteem among indigenous medicines, particularly in Unani system from the earliest times. [32,36,33]

Sunth: In Indian cuisine ginger (Sunth) is a key ingredient of many dishes. It has a vast role in traditional ayurvedic medicine. The details description of Sunth has briefly mentioned in ayurvedic Nighantus and other Ayurvedic text in scientific manner. This review study has more information about Sunth including traditional, modern as well as botanical description, cultivation, trade and commerce and also therapeutic – pharmacological contribution.

Pippali: Pippali is a powerful stimulant for both respiratory and digestive systems and showed a reviving effect on lungs. In Ayurveda, Pippali Vardhman rasayana is very effective medicine in treatment of rheumatoid arthritis, chronic fever, malarial fever. Fruit and root plant parts are used to treat various diseases and infections. Pippali is used widely as expectorant, Asthma, nausea, diarrhoea, possess hypoglycaemic, medullary stimulant and cough suppressant effects. In fruits of P. longum scientific studies have identified the properties like anti-inflammatory, anti-fertility and anti-allergic. In roots only anti-fert-

ility potential is reported. [40,39,38]

LITERATURE REVIEW

• A Critical Literature Review on Anorexia Nervosa by Victoria He

Eating disorders are mental illnesses that have broad cognitive, emotional, and physical consequences. Although the types of eating disorders are wide-ranging, they generally consist of abnormal eating patterns that stem from body dissatisfaction and an unhealthy relationship with food. The behaviours involved in eating disorders, such as self-starvation or overeating, are typically uncontrollable, and the preoccupation with food dramatically impedes the individual's quality of life. Three of the most studied eating disorders are anorexia nervosa, bulimia nervosa, and binge-eating disorder. These eating disorders have become increasingly common over the course of the 20th century, affecting women disproportionately more than men. The ratio of women to men suffering from anorexia nervosa or bulimia nervosa is 10:1, while the gender differential in binge-eating disorder is lower at a 2:1 ratio

• Ch, Iliadic & Frantz Ana, Ekaterina & Ouzounian, Petros & Kurobuta, Lambrini. (2020).

Anorexia nervosa: A literature review. Diagnostic criteria for anorexia nervosa According to American Psychiatric Organization, DSM-5 criteria allow clinical scientists to diagnose a specific eating disorder. The most common symptoms are a continuation of those symptoms of Anorexia and Bulimia Nervosa [6].

• A Review of Super Food Ajwain and Its Pharmacological Actions Shashank Mishra Trachyspermum Ammi is commonly known as ajwain is an indigenous variety of Egypt and is also cultivated in Iraq, Iran, Afghanistan, Pakistan, and India. It is an excellent natural home remedy to treat abdominal gas anorexia, nausea and vomiting.

• Review: Black Pepper (Piper Nigrum L.) Botanical Aspects, Chemical Content, Pharmacological Activities Wanda Wulandari1, Maria Dona Octavia1, Yeni Novita Sari, Harrison Rival

Black pepper spices have many benefits in life. The most commonly used service is as a spice in the kitchen because it has a distinctive taste. Black pepper is one of the oldest spices and is most widely used for cooking and in the health sector, namely traditional medicine called the "king of spices. Besides not having side effects, they can also be used for a long time. The main content of Piperine and essential oil from black pepper has many pharmacological effects, including an antioxidant, antifungal, antimicrobial, antiepileptic, increases libido, anti diarrhoea and others. Based on this, a lot of research has been done on black pepper's chemical content and its pharmacological effects.

• Johri RK. Cuminum cyminum and Carum carvi: An update. Pharmacognosy Rev. 2011 Jan;

Cuminum cyminum and Carum carvi are the sources of cumin and caraway seeds respectively, which have been used since antiquity for the treatment of various indications in traditional healing systems in wide geographical areas. Cumin and caraway seeds are rich sources of essential oils and have been actively researched for their chemical composition and biological activities.

• Mahendra P, Bisht S. Ferula asafoetida: Traditional uses and pharmacological activity. Pharmacogn Rev

The herb is an effective remedy for several diseases of the stomach. It is one of the best remedies available for flatulence and is an essential ingredient for most of the digestive powders.

• Piper longum: A concise review on Botany, Phytochemistry and Pharmacology D.K. Pandey

Long pepper or Pippali is a very important medicinal plant. It is indigenous to South-India and Western Ghats of India, and is cultivated in hotter parts of India mainly Orissa, Kerala and Central to North Eastern Himalayas. It is being used from thousands of years in various traditional medicinal practices such as Ay-

urveda, Unani etc.

• Review on the traditional and contemporary uses of Sunth (zingiber officinale rose.) And it's medicinal importance in ayurveda ajoy bhakat, sumana saha

In Indian cuisine ginger (Sunth) is a key ingredient of many dishes. It has a vast role in traditional ayurvedic medicine. The details description of Sunth has briefly mentioned in ayurvedic Nighantus and other Ayurvedic text in scientific manner. Ginger oil is also known to suppress inflammation in arthritis. Sunth has been proved to have anti platelet aggregation property. Dose of 10 gm of Sunth daily for a long period reduces platelet aggregation. In addition to inhibit platelet aggregation, Sunth also reduces platelet thromboxane synthesis.

AIM AND OBJECTIVES

AIM: -Formulation and evaluation of Appetite stimulator Granules from the Extracts Ajwain, Black Pepper, Cumin, Hing, Pippali, Sunth.

OBJECTIVE: -Formulation and evaluation of Appetite stimulator Granules from the Extracts Ajwain, Black Pepper, Cumin, Hing, Pippali, Sunth.

- To study the Appetite stimulating activity of Ajwain, Black Pepper, Cumin, Hing, Pippali, Sunth.
- To study various methods of extraction.
- To study drug profile of Ajwain, Black Pepper, Cumin, Hing, Pippali, Sunth.
- To study various properties of Ajwain, Black Pepper, Cumin, Hing, Pippali, Sunth.

MATERIAL AND METHODS

Formulation of polyherbal Appetite Stimulator Effervescent Granules is prepared by using powdered extracts of different ingredients like Ajwain, Black Pepper, Cumin, Hing, Pippali, Sunth, The Meltable binder is PEG 4000% and cetyal Alcoholm, Sodium bicarbonate, Citric, Tartaric and Fumaric acid is needed. In order to evolve Co2 from formulations. The details of the materials used for the formulation of polyherbal Appetite Stimulator Effervescent Granules are mentioned below: -

1. Polyherbal Powdered Extract
2. Sodium Bicarbonate
3. Citric Acid
4. Tartaric Acid

Method Of Preparation

Collection of plant materials: - The ingredients like Ajwain, Black Pepper, Cumin, Hing, Pippali, Sunth were collected from the grocery store and home spices.

Preparation of herbal leaf extracts: The ingredients like Ajwain, Black Pepper, Cumin, Hing, Pippali, Sunth are taken and coarsely powdered. 10 grams of coarsely powdered, dried and used.

Ingredients	Quantity (gm)	Role
Powdered Extract	50	Herbal Appetizer
Sodium Bicarbonate	50	Base
Citric Acid	21	Imparts acidic taste and provide water of crystallisation as Granulating fluid
Tartaric Acid	24	Provide water of crystallisation as granulating fluid (cannot be used alone produce granules of weak mechanical strength)

Table 8 Ingredients Used and their Role

Procedure: -

- Mix the powder and transfer them to a hot porcelain dish.
- Heat the powder mixture using water bath, pressing the powder with spatula to form a damp coherent mass.
- Sieve the resultant mass using sieve no. 12#

Container and Storage: - Wrapped and kept in well closed air tight container in a dry place.

Direction: - Add in water before use and take during evolving carbon dioxide gas.

Material Used: -

1. **Powdered Extract: -**Polyherbal powder extract contains various ingredients and each ingredient plays important role in the formulation.
2. **Sodium Bicarbonate:** Sodium bicarbonate, NaHCO3, is a common ingredient in effervescent powders and tablets. The carbon dioxide leads to the resultant fizzing of the effervescent powder. All carbonate salts on the FDA generally regarded as safe list. There is no evidence in the available information on sodium carbonate, sodium bicarbonate, that demonstrates or suggests a hazard to the public.(50)
3. **Citric Acid: -**Citric acid is a weak tricarboxylic acid found in citrus fruits like lemons. CA dissolves fast, rapidly creating the acid environment needed for a vigorous fizzing reaction with sodium bicarbonate (SBC). The smaller the particle size of CA, the faster the reaction. The preferred form of CA for direct compression, is Citric Acid Anhydrous (CAA).(51)
4. **Tartaric Acid: -**A combination of tartaric acid and citric acid is used as an effervescent base rather than either acid alone because when tartaric acid is used alone, chalky friable granules are produced and citric acid alone results in sticky mixture too difficult to granulate. (52)

RESULTS & DISCUSSIONS

A. Physical Evaluation

Formulated granules were evaluated for its colour, visually colour was checked. Odour was found by smelling the product. The effervescence was tested by dissolving in the water. The test parameters were Colour, Odour and Texture.

B. Appearance and Homogeneity

The prepared formulation appears as brownish and greenish brown colour. The Herbal granules were homogenous.

Figure 11 Prepared Granules After Seiving and Shifting

A. Bulk Density : Bulk density is defined as the ratio of weight of powder to the bulk volume is the volume occupied by certain weight of powder when gently poured into the measuring cylinder. 10gm of powder sample was weight accurately. Then it was transferred in to a 100ml measuring cylinder. The volume was noted as bulk volume V1 (53)

Bulk density = weight / bulk volume

B. Tapped Density

Tapped density is the ratio of weight of powder to the tapped volume. Tapped volume is the volume occupied by certain weight of powder after standard no. of tapping. (53)

Tapped density = weight / tapped volume

C. Hausner's Ratio: -

Hausner's ratio is the no. that is co-related to flowability of the powder. (54)

Hausner's ratio = Tapped density / bulk density

Hausner's Ratio= 0.87/0.5 = **1.74**

Hausner's Ratio = 1.74 (Poor Flow)

D. Angle of repose: Angle of repose is defined as the maximum angle possible between the surface area of the pile of powder and horizontal plane. (55)

Result: As we know, Tan Ø = h/r Ø= 14.40 (Flow= Excellent)

E. Carr's Index

Carr's Index = (Tapped Density-Bulk Density)/Tapped Density* 100(54)

F. Effervescence Time: One dose (1 g) of the effervescent granules was placed in a beaker containing 200 mL of distilled water at 25 °C. The mixture was observed for the evolution of bubbles of gas. The time it took for the evolution of bubbles recorded. The determination was done and the effervescence time recorded. (56)

Time= 54 Second

SUMMARY AND CONCLUSION

Following conclusion can be drawn from the results obtained in the present work of Investigation: -

- This polyherbal granules are maintaining the hygiene and safer with minimum side effect than chemical-based drugs.
- Formulated polyherbal granules are capable to acquire the hunger and shows rapid activity against various gastric problems.
- Evaluation and comparison of results with commercial Herbal preparations are demonstrated that formulated herbal granules.
- The formulated polyherbal granules has good scope in the future by increasing natural ingredients for manufacturing more and safer natural remedies, in the research and health care of public, society and nation.

- It is concluded that formulated polyherbal granules were found to be of good quality.

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