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A Review on Moringa Oleifera Effervescent Tablet.

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ABSTRACT:
Finding a suitable binder for a conventional dosage of Moringa oleifera leaf aqueous extract and packaging it into tablets is the aim of this investigation. A range of binders, such as maize starch, gelatine, and micro-crystalline cellulose (MCC), were used to extract and manufacture aqueous extracts of Moringa oleifera leaves in order to determine which one provided the best tablets of aqueous extracts of Moringa oleifera leaves. The formulations were described using physicochemical parameters (bulk density, tapped density, moisture content, Haussler's ratio, Carr's index, ash value), strength (crushing strength and friability), and release properties (disintegration and dissolving durations tests). Tablets made with gelatine as a binder exhibited the lowest friability and disintegration time when compared to those made with MCC or maize starch. Aside from maize.[13]
One common metabolic condition associated with Polycystic Ovary Syndrome (PCOS) is insulin resistance. It is anticipated that Moringa oleifera will lower insulin levels and promote follicular genesis in PCOS, since it has been demonstrated to increase insulin expression and decrease the degree of insulin in diabetes mellitus.
Key words :- moringa oeifera, Polycystic Ovary Syndrome, Insulin, Diabetes

I. INTRODUCTION:

Moringa oleifera, also known as the "miracle tree," is a plant with immense medicinal and nutritional benefits. Its leaves, seeds, flowers, and bark are rich in antioxidants, vitamins, and minerals, making it a popular ingredient in various health supplements[1]. An effervescent tablet is a type of tablet that dissolves in water, releasing carbon dioxide gas, which creates a fizzing or bubbling effect. Moringa oleifera effervescent tablets are a convenient and tasty way to consume the benefits of moringa.[13] These tablets typically contain a blend of moringa extract, vitamins, and minerals. They may provide various health benefits, including:

- **Antioxidant properties:** Moringa's high antioxidant content can help protect cells from damage caused by free radicals.
- **Inflammation reduction:** Moringa has anti-inflammatory properties, which may help reduce inflammation and alleviate conditions such as arthritis.
- **Energy and endurance:** The vitamins and minerals in moringa, such as iron and vitamin B12, can help boost energy levels and enhance endurance.
- **Immune system support:** Moringa contains compounds that may help stimulate the immune system and increase its response to infection.[7]

When choosing a moringa oleifera effervescent tablet, look for products from reputable manufacturers that adhere to good manufacturing practices (GMPs) and use high-quality moringa extract. Always follow the recommended dosage and consult with a healthcare professional if you have any underlying medical conditions or concerns.

An endocrine-metabolic condition known as polycystic ovarian syndrome (PCOS) has serious health effects on women, including infertility [13]. The occurrence of polycystic ovary syndrome in women who are of reproductive age, which is 6–10% according to US NIH guidelines and up to 15% according to Rotterdam guidelines 2003 [13]. Based on the ESHRE/Rotterdam criteria from 2003, the NHMRC's 2015 data showed that 12–21% of women in Australia who were of reproductive age had PCOS. Multifactorial, endocrine, genetic, and diverse complexities make up PCOS [13]. PCOS is diagnosed using the ESHRE / Rotterdam Criteria 2003 if two of the

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three criteria — polycystic ovary, oligo ovulation / anovulation, or clinical or biochemical evidence of hyperandrogenism — are met. It was not possible to determine the specific pathogenesis or etiology of this condition.

Anaemia is characterized by a haemoglobin deficiency in the erythrocytes, which affects the concentration of oxygen in the blood. The primary purpose of haemoglobin is to transport oxygen throughout the cells, which is crucial for the erythrocyte's development. However, low levels of degradation iron may prevent the formation of haemoglobin, which could lead to anaemia in certain individuals. The Moringa cease family, which includes 13 tree and shrub species found in the sub-Himalayan regions of India, Sri Lanka, Africa, and Arabia, includes the widely distributed and naturalized Moringa oleifera (Ramachandran et al., 1980) (Adedapo et al., 2009). The tree can be found growing wild and farmed on the plains, especially in hedges and backyards, and can reach a height of 5 to 10 meters (Morton et al., 1991). In addition to other phytochemicals like carotenoids, it contains a number of vitamins and minerals. The stem bark contains two alkaloids, moringine and moringinine (Kerharo et al., 1969).[13]

Plant Profile

Scientific classification:

- **Family:** Moringa cease
- **Kingdom:** Plantae
- **Order:** Brassicales
- **Genus:** Moringa
- **Species:** M. oleifera
- **Height:** (32 - 40 ft)
- **Diameter:** (1.5 ft)
- **Colour:** Bark - Whitish grey, young greenish flower fragrant.
- **Bisexual and Surrounded Flower:** are about 1.0 - 1.5 cm (long) and 2.0 cm (broad)[1]

Fig :-moringa oleifera

II. MATERIAL AND METHODS

Material:

Moringa oleifera extract from moringa oleifera leaves, we purchased moringa oleifera leaves from local market. In the laboratory, fresh Moringa oleifera leaves were shade-dried. The stems were removed and the size of the leaves was reduced using a mixer grinder. The weight of the dry powder was noted.

The powdered moringa oleifera leaves were macerated in hot water for 24 hours at 40°C with a thermostat. The yield of the extract was computed by dividing the weight of the extracted material by the weight of the powder.[14]

Methods:-

Extraction of Moringa oleifera leaves:

Fresh Moringa leaves were shade-dried for three days in the Pharmaceutics lab. The leaves were chopped to size and the stems removed with a mortar and pestle. The weight of the dry powder was noted. An aqueous extract was produced using a rotary extractor and allowed to dry at room temperature (27°C) for seven days. To calculate the % yield, the extract was weighed and then reduced in size using a porcelain mortar and pestle. After sieving the powder, the part that passed through a 180-meter sieve was used in the experiment.[14]

Characterization of Moringa oleifera powder:

The moisture content of Moringa oleifera powder was determined using a moisture analyser. The powder was evenly distributed around the tray and added to the moisture balance at a weight of 3 g. The machine's temperature was set to 130°C. The readings were taken when the machine shut down on its own. The experiment was repeated twice, and the average of the three measurements was used to determine the moisture content.[14]

Granule Characterization:

The following test (Angle of repose, bulk density, tapped density, and moisture content) were carried out as earlier described for moringa powder on the granules produced prior to compression into tablets.[14]

Compression of granules into tablets:

Before compression, the granules were combined with magnesium stearate and talc. Using a die and a flat punch set with an 8 mm diameter and a compressional force of 6 metric tons, the granules were compressed into circular tablets using a single punch tablet press. Before the quality

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control testing, the pills were stored for 48 hours in airtight containers.[14]

Evaluation of Moringa oleifera effervescent tablet:

1. **Tablet weight variation test:** Twenty tablets from each formulation were chosen at random and weighed separately. To account for weight variance, the average weight was compared to the individual weights. For each tablet, the percentage weight changes were noted.[11]
2. **Tablet thickness test:** A digital tablet hardness test device (Veego Digital Tablet test apparatus, Veego Instruments) was used to measure the thickness of ten randomly selected tablets from each recipe.
3. **Tablet hardness test:** A Veego Digital Tablet Hardness test device was used to measure the hardness of five randomly chosen tablets from each recipe.
4. **Tablet friability test:** A fibrillatory (Veego Tablet Friability Test Apparatus, India) was used to weigh ten tablets and tumble them for four minutes at a speed of 25 rpm. They were reweighed after being brushed off. Equation 6 was used to assess the produced tablets' friability as a percentage of weight loss.[9]
5. **Tablet disintegration test:** Six tablets were randomly selected from each formulation and put into each of the six tubes of the disintegration test device (Manesty, Liverpool, England). Until all of the tablets broke up and passed through the sieve at the bottom of each tube, they were periodically lowered into and raised from the disintegration medium, which was made of distilled water and kept at 37 ± 2° C.

Formulation of Moringa oleifera leaves extract effervescent granules:

By altering the ratio of the acid-base components (1:2, 1:3), the effervescent granules of moringa extract were prepared using the wet granulation method. Displays each component's formula and quantity. Citric and tartaric acids were extensively combined with the leaf extract of Moringa oleifera. To get homogeneous grains, the mixture was sieved through sieve number twelve. After drying, sodium bicarbonate and additional excipients were added to the resulting granules. Additionally, to eliminate the water content, the acid and base components were combined, sieved through sieve number 14, and dried in an oven set at 50°C for one hour.[15]

Evaluation of the granules particle size distribution:

A conventional sieve set was used to evaluate the granules' particle size distribution. From top to bottom, the sieves and collecting pans were positioned in the following order: 20, 30, 50, 60, 80, 100, and collection pans. Additionally, 100 grams of effervescent granules were employed as the sample. Each sieve and collection pan was weighed at the beginning, and the setup was put on.[15]

Evaluation of the granules moisture content:

Five grams of the granules were weighed and put on the moisture content analyser to determine the moisture content. The device was operated at an annealing temperature of 100°C for 15 minutes. The prior validation showed that a consistent weight had been obtained for these granules after 15 minutes. The device displayed the moisture content as a percentage.[15]

III. RESULT AND DISCUSSION:

In effervescent formulations, moringa leaves were utilized as a nutrient-dense component. The simplicial moisture content was reduced to less than 10% by drying the leaves. simplicial moisture content was suppressed during the drying process in an attempt to preserve its nutritional stability and stop the growth of Molds, fungi, and bacteria. According to a prior study, aeration drying at room temperature is a cost-effective technique because it preserves the nutrient content while controlling a significant quantity of bioactive material. When compared to alternative drying methods, this one likewise preserves the maximum phenolic content (Ali et al., 2017). The powder was created by milling the dried simplicial leaves and reducing their particle size. The goal of processing into powder is to improve efficacy and functionality. The leaf powder can be made into pharmaceutical formulations as nutraceutical products or added to a variety of food and drink items. The wet granulation process was used to create the granules. To prevent untimely reactions during granulation, the procedures for basic and acidic components were completed independently. The three formulations' granules were dark green and smelled quite good. The goal of bulk density measurement is to ascertain the bulk of the material. This characteristic affected the choice of dosage pack and the procedure for filling the primary package since it described the volume that a specific quantity of granules would occupy (Van den Ban

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dan Goodwin, 2017). Moreover, the flow properties were indirectly determined by calculating the Hauser ratio and compressibility index. While the Hassner ratio monitored inter-particulate friction, the compressibility index examined the strength and stability of the link between particles. The purpose of evaluating granule properties during reconstitution is to see how various effervescent agent ratios affect the capacity to disperse and the suspensions that are produced. The reconstituted granule characteristics evaluation findings are listed in a table. To forecast consistency, pourability, and dispersion stability, the viscosity and flow characteristics of the granules following reconstitution were assessed. The dispersion viscosity ranged between 326 - 333 cps at a shearing stress of 100 grams, according to the evaluation results of the sample viscosity using the manually operated Stormer Cup and Bob viscometer. Following reconstitution using ANOVA, the statistical analysis of the effervescent agent ratio's impact on preparation viscosity revealed that the ratio difference had no influence on preparation viscosity ($p>0.05$). As effervescent agents that do not cause changes in viscosity, the interaction of acid and base components was the cause of this; also, the proportional differences across formulations were not very great. Factors with greater impact on the preparation viscosity include the concentration of the suspending agent, thickener, and temperature.[16]

IV. CONCLUSION:

The effervescent granule formula made from moringa leaves in this study met quality standards and had good flow properties and a homogeneous particle size distribution. Additionally, compared to the other formulae, formulation 3 displayed superior flow characteristics. The three formulations were quickly distributed within 207 – 229 seconds, according to the evaluation results of the reconstituted granules. The viscosity was between 326 - 333 cps, the preparation's pH ranged between 5.73 - 5.91 (neutral pH), and it displayed dilatant flow characteristics. Additionally, the panellists approved of the three recipes based on the results of the organoleptic and sensory examination. Furthermore, in terms of colour, taste, scent, and texture, formulation 3 (sodium bicarbonate 6:7 citric acid ratio) was the most palatable.[16]

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