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Preparation of Tablet from Naagdon Plant by Wet Granulation Method for Treatment of Excessive Bleeding in Piles

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Abstract: ***The objective of present study was to formulate and evaluate the tablets for piles with different combination of herbal drugs. Material and Method: The tablet for piles containing lactose and mannitol as diluent and containing natural drugs like naagdon which was prepared by wet granulation method. The wet and compressed formulations were subject to several evaluation parameters like appearance, thickness, weight variation, hardness and friability. Results: The results of all evaluation parameters of piles tablet were within the acceptable limit. Pre-compression studies of piles tablet show satisfactory results. The thickness, hardness, weight variation, and friability of piles tablet were found to in acceptable range. The in-vitro drug release of eugenol from optimised for treatment piles formulation was found to be 90.23%. Significant results were obtained from present study. Discussion: The finding of current investigation clearly found that the health promotion of the body could be done by piles***

I. INTRODUCTION

If there is one thing the medical world might be doing wrong, it is definitely underrating the power and untapped potential of Ayurveda. Plants have always held a superior position when it comes to healing and medicinal properties. Delving deeper into the plant world, one can find superheroes in the form of herbs and plants that possess immense power and value. Amongst these green super plants, one of them stands out very well.

Naagdon, scientifically known as Euphorbia Tithymaloides, is a medicinal herb that is commonly found in nature and can be extensively used for a whole array of symptoms and illnesses.

Nagdon plant is extensively used to treat piles, excessive bleeding, constipation, joint pain and all sorts of bleeding disorders naagdon is good medicinal herb to stop abnormal bleeding from any body part such as in piles, periods ,colitis etc.

Naagdon is very common plant and mainly used ornamental plant because of its dark green steam and leaves.

Formulation of nagdon tablet for piles treatment. extraction of crude drug from plant nagdon it found moist humidity envorment Hemorrhoids (HEM-uh-roids), also called piles, are swollen veins in your anus and lower rectum, similar to varicose veins. Hemorrhoids can develop inside the rectum (internal hemorrhoids) or under the skin around the anus (external hemorrhoids).

Nearly three out of four adults will have hemorrhoids from time to time. Hemorrhoids have a number of causes, but often the cause is unknown.

A. Internal Hemorrhoids

Internal hemorrhoids lie inside the rectum. You usually can't see or feel them, and they rarely cause discomfort. But straining or irritation when passing stool can cause:

Painless bleeding during bowel movements. You might notice small amounts of bright red blood on your toilet tissue or in the toilet.

A hemorrhoid to push through the anal opening (prolapsed or protruding hemorrhoid), resulting in pain and irritation.

B. Thrombosed Hemorrhoids

If blood pools in an external hemorrhoid and forms a clot (thrombus), it can result in:

Severe pain Swelling Inflammation

A hard lump near your anus

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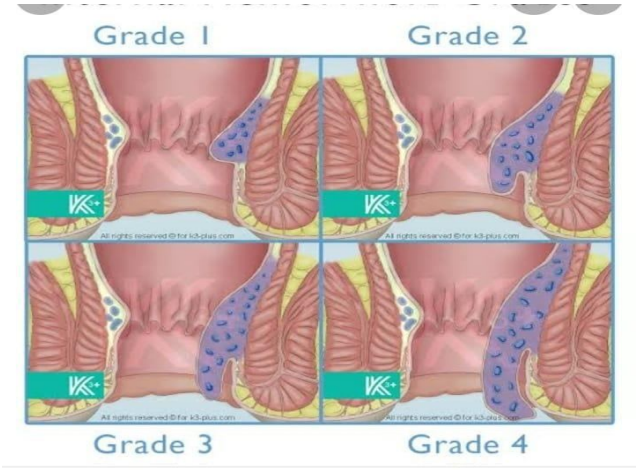


Fig 1: types of piles

II. MATERIALS AND METHOD

A. Materials

Naagdon were received from mountain . All other ingredients such as mannitol, magnesium stearate and talc were purchased from Central Drug House (CDH) New Delhi, India. All ingredients used were of analytical grade. Method naagdon tablets were prepared by wet granulation method. Other ingredients like lactose was used as diluent, magnesium stearate as lubricant and talc as glidant. All the excipients along with API weighed as shown in Table 1 and passed through sieve no. 20. Then, all ingredients were mixed following geometric mixing excluding glidant and lubricant thoroughly for 15min.4 The powder blend was thoroughly mixed with talc and magnesium stearate and compressed into a 400mg tablet using single rotatory punching machine (KI-150, Khera Instruments Ltd. New Delhi, India).



Fig 2: black paper and naagdon plant



Fig 3 : crushing of black paper and naagdon leaves

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Fig 4: cutting of plant

III. NAAGDON PLANT BENEFITS, PROPERTIES, USES & SIDE EFFECTS

If there is one thing the medical world might be doing wrong, it is definitely underrating the power and untapped potential of Ayurveda. Plants have always held a superior position when it comes to healing and medicinal properties. Delving deeper into the plant world, one can find superheroes in the form of herbs and plants that possess immense power and value. Amongst these green super plants, one of them stands out very well.

Naagdon, scientifically known as **Euphorbia Tithymaloides**, is a medicinal herb that is commonly found in nature and can be extensively used for a whole array of symptoms and illnesses.

Nagdon plant is extensively used to treat piles, excessive bleeding, constipation, joint pain and all sorts of bleeding disorders.


Fig 5: flower of naagdon

A. Bio & Properties

Nagdon Plant Uses and Remedies

1) PILES
2) INTESTINAL WORMS
3) DIABETES
4) RESPIRATORY AILMENTS
5) SKIN DISEASES
6) BOWEL ILLNESS
7) HEAVY PERIODS
8) JOINT PAIN
9) CONSTIPATION
10) ULCERATIVE COLITIS
11) AMEBIASIS, INTESTINAL INFECTION
12) ABDOMINAL PAIN
13) URINARY AILMENTS
14) BOILS AND WOUNDS

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Although native to tropical and subtropical North America and Central America, the herb is very commonly found in all areas and can be easily located in gardens and parks in a collection of shrubs or hedges. Naagdon, or Nagdon, is more commonly known as Devil's Backbone around the world and is also used as a decorative plant. A fun little trivia fact; Naagdon is also informally called Christmas candle, buck- thorn, redbird cactus and more. Pretty exciting bio for a common garden herb. Lastly, if the names still don't ring a bell, they are also known as airi, baire, and agia in India.

The stem, often resembling a cane structure, sometimes looks like a miniature bamboo plant. But what sets it apart from other botanically related plants is that it is arguably the only plant which produces non-toxic latex, when extracted correctly. Naagdon propagates through stem cutting and seeding, hence the bamboo-like structure.

The leaves are smooth and elliptical and the plant bears flowers which are void of any scent. Even though no distinct scent can be traced to a Naagdon plant, one way to identify it is by observing the humming birds or cabbage worms in the vicinity, both highly attracted to this particular herb. The plant leaves are bitter in taste and are on the thicker side while being foot shaped.

IV. NAGDON PLANT USES AND REMEDIES

Naagdon is a boon when it comes to treating bowel related issues, specifically to stop abnormal bleeding from any body part such as in piles, periods, colitis, etc. Not limited to these, its uses also extend to treating joints and wounds. Naagdon root is known to be a powerful emetic and is frequently used to induce vomiting as well. Not just that, the plant is highly versatile in terms of medicinal properties such that every single part of it can be used for multiple cures. Also, most illnesses follow a general consensus for treatment using Naagdon. The variation is very little and often only about change in form or dosage amount. Following are the prescribed dosages and methods that can be used to treat the particular diseases:

A. Piles

Commonly known as Bawaseer in India, Naagdon helps in treating bleeding piles and infection, especially helping stop the blood flow to speed up recovery. To treat bleeding piles, drink Naagdon decoction in the morning on an empty stomach.

B. Intestinal Worms

The latex extracted from Naagdon has been shown in experiments to be effective against intestinal worms and to reduce inflammation when ingested. This herb is widely used in major Ayurvedic medicines when it comes to treating intestinal syndromes. Take Naagdon-Dudhi juice and drink it daily or as advised by your Ayurvedic practitioner to cure the infection.

C. Diabetes

Not just intestines, Naagdon plant's latex is also capable of combating diabetes mellitus, commonly known as diabetes. Further research is being conducted to bring better and faster cure results using this medication.

D. Respiratory Ailments

Nagdon leaves have been used to treat asthma, persistent coughing, laryngitis, mouth ulcers, and even venereal disease. The leaves are normally consumed as is or turned to some other forms.

Drink Naagdon tea as advised by a practitioner for best results.

E. Skin Diseases

The latex has been used topically to treat calluses, ear ache, insect stings, ringworm, skin cancer, toothache, umbilical hernias, and warts, although some remedies are yet to be scientifically proved effective. Despite the lack of scientific evidence, the treatments do help to quite an extent when coupled with a prescribed treatment course. Latex can be applied or spread on the affected area to help with the treatment.

F. Bowel Illness

Due to Naagdon possessing euphorbol, it acts as a powerful emetic. An emetic is a compound that can cause expulsion of one's stomach contents through mouth or nose, i.e. vomiting. A few drops of the latex are added to milk and used as an emetic for treating stomach related illnesses.

G. Heavy Periods

Heavy periods (menorrhagia), over bleeding in periods, and to some extent, cramps and potential infections, can be greatly relieved using Naagdon. Consume a Naagdon powder recipe daily in the morning on an empty stomach. It is advisable to confirm the dosage amount with a medical professional first.

H. Joint Pain

Joint Inflammation is a very common occurrence and can often last for long periods of time. Using Naagdon in desired method and form, it can be used to treat joint pain and inflammation. Apply Naagdon paste on the affected areas like a balm or lotion. Repeat as per amount of discomfort felt during the day.

I. Constipation

From acute to chronic constipation, Naagdon is an effective medicine regulating one's bowel. Additionally, the plant has also been observed to be useful to treat diarrhea as well. Standalone Naagdon leaves are consumed here, their juice raw juice being super effective. Chew on Naagdon leaves daily to cure constipation.

J. Ulcerative Colitis

A severe large intestine disease, it is a chronic inflammatory condition often accompanied by ulcers and sores and even weight loss in the long run. Naagdon has been proven to be a powerful remedy to cure Ulcerative Colitis. Take a basic Naagdon juice and drink daily in the morning on an empty stomach.

V. WET GRANULATION THE ULTIMATE GUIDE FOR BEGINNERS AND PROFESSIONALS

In this guide, you are going to learn about two critical aspects – wet granulation process and wet granulation machines. For that reason, this article will have two distinct sections, where I will exhaustively discuss each of these aspects. Frankly, you can only choose a suitable wet granulation machine after knowing how wet granulation process takes place.

Even before I proceed, I would like you to review these two images:

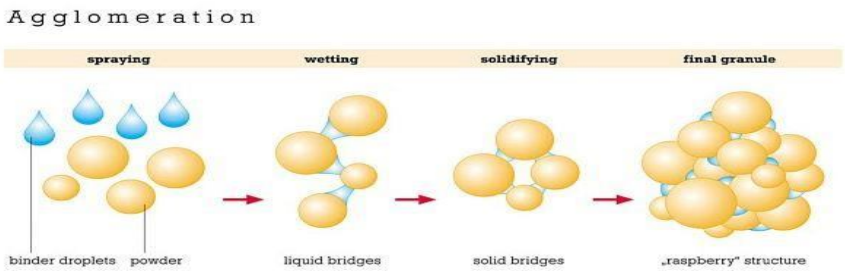


Fig 6: granulation

A summary of how wet granulation process takes place: Image source: Pharmacy Tips

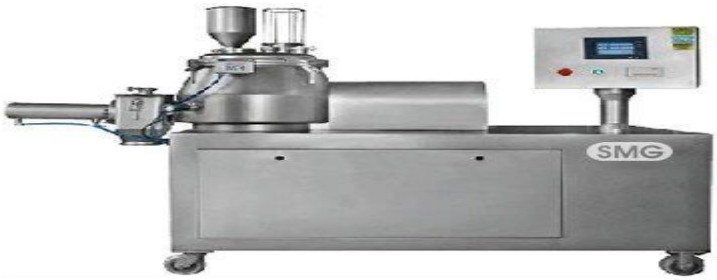


Fig 7: tablet punching machine

Basically, the two images summarize what I am about to discuss here.

Let's go straight to the main subject of this wet granulation guide:

A. Section 1: Wet Granulation Process

This section focuses on the following key points:

1) Definition of wet granulation
2) Types of Granulation Processes & Techniques
3) Wet granulation process – An overview of different stages in wet granulation
4) Advantages of wet granulation process
5) Disadvantages of wet granulation process
6) Key application of wet granulation in industries
7) Factors affecting efficiency of wet granulation

At the end of this section, I am sure you should be able to choose a suitable wet granulation machine.

Now, let's discuss each of these points:

VI. DEFINITION OF WET GRANULATION

Wet granulation is the process of binding different powder particles together using adhesives or liquid solution.
All these occur under the action of an impeller.

This results in particle enlargement as you can see in the image below:

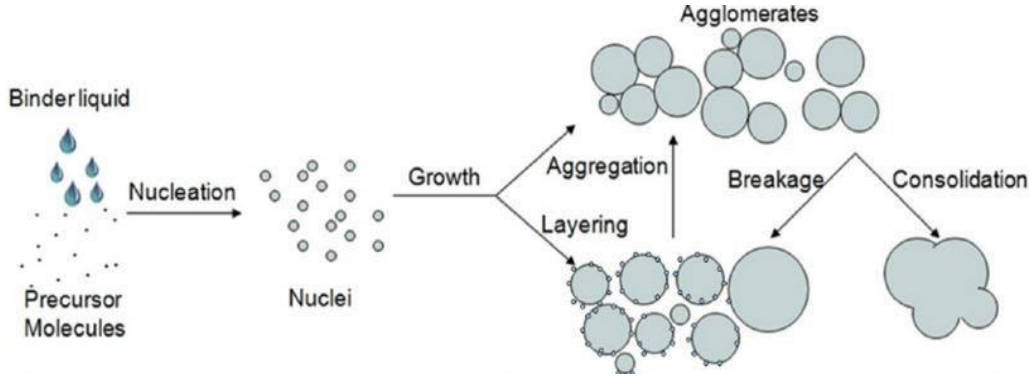


Fig 8: granulation technique

Basically, this process does not depend on any compressive forces to form granules.
It is quite different from the roller compactor granulation process.
As you will learn later in this section, granulation is a critical procedure in pharmaceutical and food processing industries.
Mostly, you have to granulate powders before subsequent processing in the capsule filling machines or tablet press machines.
With all these in mind, now let's have a quick overview of the various types of granulation processes.

VII. TYPES OF WET GRANULATION PROCESSES AND TECHNIQUES

For a fact, there are quite a number of material granulation processes and techniques today.
Therefore, it could have been unfair to focus only on wet granulation without mentioning other processes.
Whenever you think of granulation process in the pharmaceutical or food processing industries, the main options to choose from include:

1) Wet granulation process
2) Dry granulation process

You will learn more about the differences between the two processes shortly.

Normally, choosing a particular process will depend on an in-depth understanding of:

a) Physiochemical properties
b) Excipients
c) Release properties
d) Specific flow

With this knowledge, you can comfortably go ahead to choose an appropriate granulation technology.
Some of the most popular granulation technologies include:

A. Roller Compaction

It is an example of dry granulation process.
I have written an interesting and informative article on this: Roller Compactor for Dry Granulation.

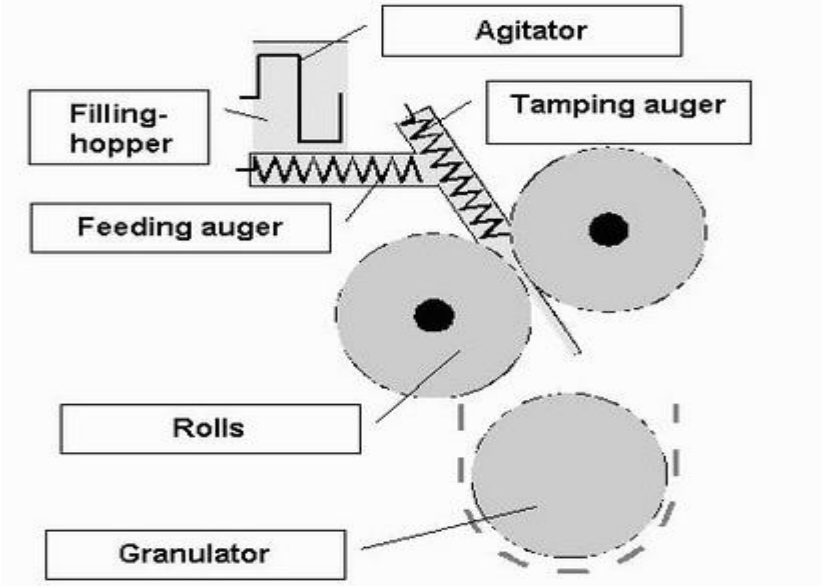


Fig 9: Roll compactor process

Please spare some time to learn how roller compactor can guarantee material processing success.

B. Fluid Bed Granulation

This is a good example of wet granulation technique.
Again on this subject, I have written a comprehensive article: A Definitive Guide to Fluid Bed Granulation Process.

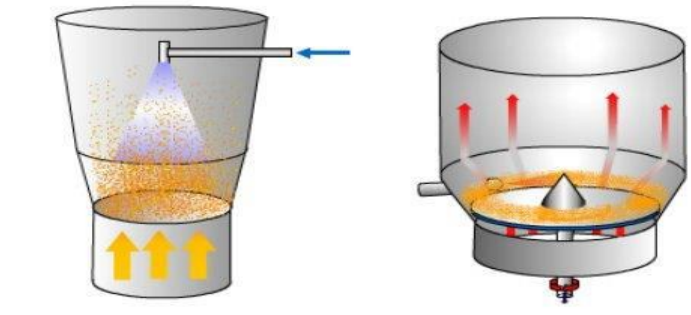


Fig 10: fluidised bed dryer

It is an important guide if you want to become a professional in fluid bed granulation process.

C. High Shear Granulation/High Shear Wet Granulation Process

It is another example of a wet granulation process. Remember, this is the main subject of this article.
Now, let me go straight to the main differences of wet granulation vs. dry granulation processes.
First, in the wet granulation process, you will add a granulating fluid that can be water or other solvents.
It is this granulation fluid that helps in bonding particles together.
On the other hand, in dry granulation you don't need any form of liquid. The process mainly involves compacting powder particles without adding any form of fluid or solvent.
Therefore, the compacting force is responsible for boding particles together. Second, dry granulation process is suitable for materials that are heat and moisture sensitive. Such materials/substances are sensitive to both organic solvent and water. Due to these variations in the granulation techniques and processes, the design of these machines is also different. In both cases, the complexity of wet granulation vs. dry granulation processes will depend on the characteristics of the material/powder.

VIII. EVALUATION OF NAAGDON TABLET

Tablets Pre-compressional studies of powder blend In development of new dosage form preformulation study is the prior step in the potential drug development. It is the principal investigation in the drug development to obtained information on the known pr operties of compound and the proposed development schedule. So, this preformulation investigation may merely confirm that there are no significant barriers to compound development. Following pre-compressional parameters were studied like angle of repose, bulk density, tapped density, compressibility indices etc.

A. Angle Of Repose

It is the maximum angle that can be obtained between the freestanding surface of powder heap and the horizontal plane. It was determined by using fixed funnel method. Specified amount of powder drug was transfer to the funnel keeping the orifice of the funnel blocked by thumb. When powder was cleared from funnel then measured its angle of repose and measured in θ 7 . Angle of repose (θ) = tan-1 h/r

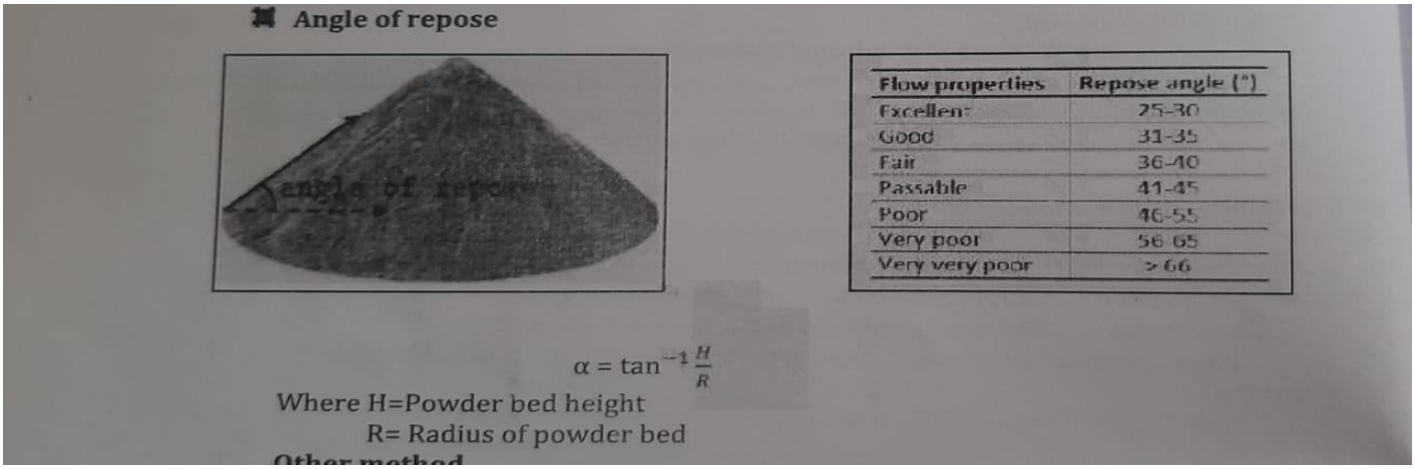


Fig 11: formula for angle of repose

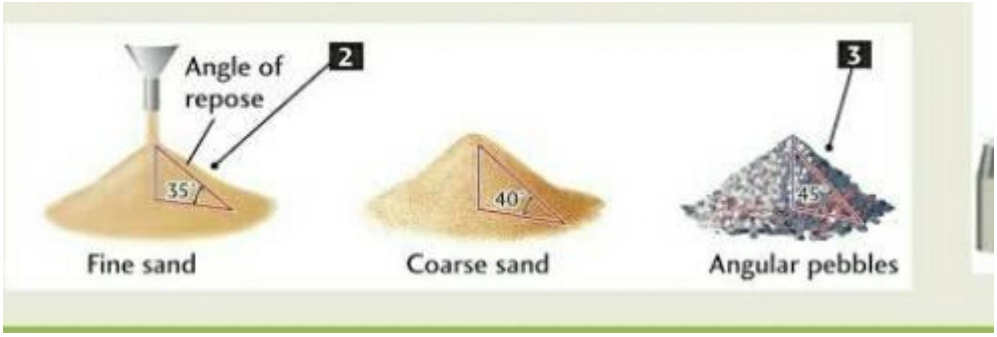


Fig 12: angle of repose

B. Bulk Density

It is the ratio of bulk mass of powder to the bulk volume. It is denoted by ρb. Bulk density is used to find out homogenecity. Bulk density (ρb) = M/Vb Where, M is the mass of the sample, Vb bulk volume

C. Tapped Density

It is the ratio of the weight of powder to the minimum volume occupied in measuring cylinder. Tapped density is determined by placing a graduated cylinder containing known mass of drug or formulation on a mechanical tapper apparatus which is operated at fixed no. of taps (1000) until the powder bed reached a minimum volume. 8 Tapped density (ρt) = weight of powder blend/Minimum volume occupied by cylinder

1) Compressibility Indices

Ca rr's i n d ex

Based on the apparent bulk density and the tapped density, the percentage compressibility of the powder mixture was determined by the following formula.

Carr‟s index = Tapped density-Bulk density × 100/ Tapped Density

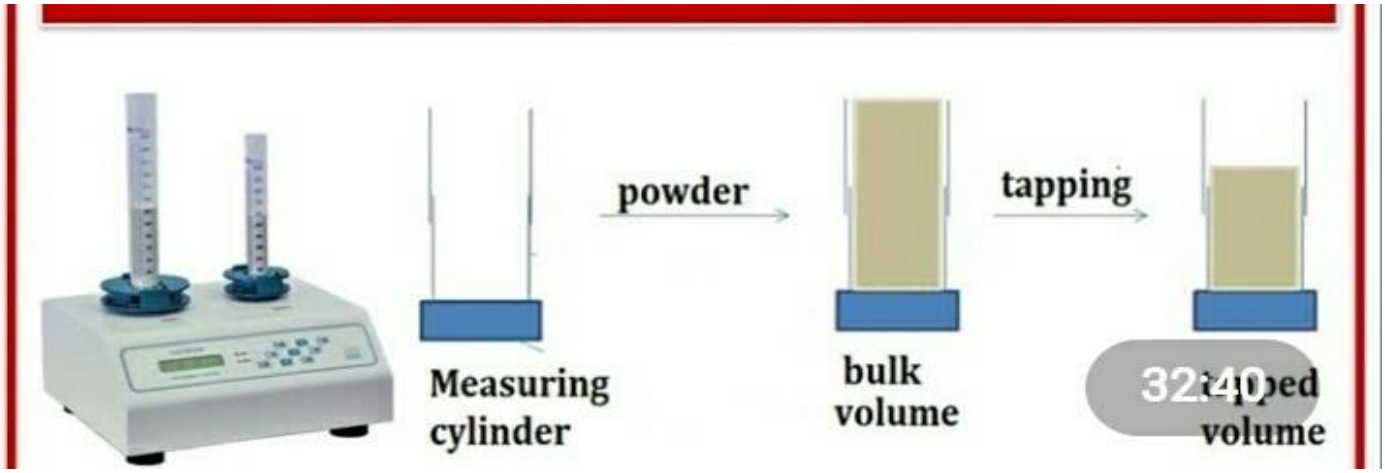


Fig 13: tapped density equipement

2) Ha us ner ' s r a ti o

It is an indirect index of ease of measuring of powder flow. Lower Hausner‟s ratio (1.25). 10 Hausner‟s ratio = Tapped density/ Bulk density were evaluated for various parameters after consideration of preformulation to overcome errors during formulation preparation. These are like appearance, thickness, weight variation, hardness and friability.

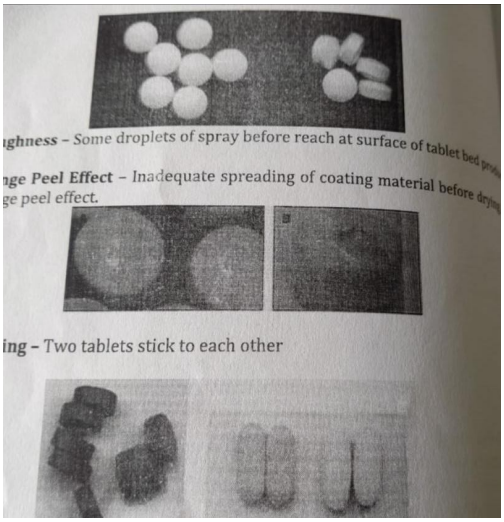


Fig 14: tablet evaluation

D. Physical Appearance

The general appearance of tablet was studies visually in shape, color, texture and odour.

E. Thickness

The tablet thickness was calculated by Vernier calipers. Tablet was put in between two jaws vertically and measured thickness and 6 tablets were used for this test and expressed in mm. 8

F. Weight Variation

Weight variation test is run by weighing 20 tablets individually, calculating the average weight and comparing individual tablet weight to the average. The weight variation test would be a satisfactory method of determining the drug content uniformity of tablets

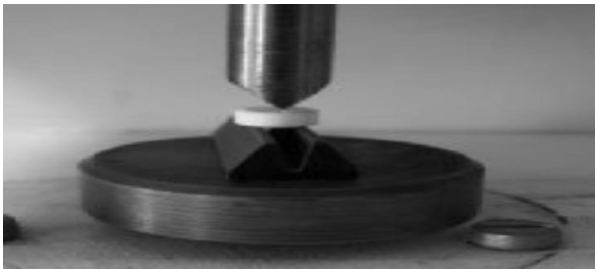


Fig 15: hardness tester

G. Hardness

Hardness also termed as tablet crushing strength. The tablet hardness was determined by Monsanto hardness tester. The tablet was placed lengthwise between upper and lower plunger and force applied by turning a threaded bolt until the tablet fractures and measured hardness of tablet in Kg/cm2 7, 8 .

H. Friability

It is determined by Roche friabilator, subjects a number of tablets to combined effects of abrasion and shock by utilising a plastic chamber that revolves at 25 rpm, dropping tablet from inches distance operated for 100 revolutions. Preweighed tablets were dusted and reweighed and according to standard limit friability should be less than 1%. It is calculated by formula-% Friability = Initial weight – Final weight / Initial weight. 9

I. In-vitro Drug Release

Dissolution profile of eugenol was determined at 37 ± 0.5°C at a stirring rate of 100 rpm using the USP dissolution apparatus II in 900 ml of simulated gastric fluid (0.1 N HCl) . Various aliquot samples were withdrawn with replacement simulated fluid of same amount at 5, 10, 15, 30, 45, and 60 min respectively. Samples were filtered using whatmann filter paper and taken absorbance at wavelength of 366 nm by UV spectrophotometer. 1

IX. RESULTS AND DISCUSSION

The naagdon tablet was formulated by wet granulation method. This technique was used for conventional from Naagdon tablet which minimize processing steps and eliminated wetting and drying process. The physiochemical property show satisfactory results by Naagdon tablet which are within the range of prescribed standards required for investigation of present study

A. Pre-Compression Studies of Powder Blend

The powder blend was evaluated for various parameters and their results are shown in Table2. The evaluation parameters such as angle of repose, bulk density, tapped density, Carr‟s index and Hausner‟s ratio were found to be 21.12±0.11 to 27.46±0.12 (Ɵ),0.4071±0.21 to 0.4741±0.32 g/ml, 0.4132±0.17 to 0.4965±0.028 g/ml, 11.00±0.12 to 14.17±0.39, 1.11±0.012 to 1.17±0.13 respectively. After evaluation of preformulation parameters it showed that there is no presence of moisture in power and showed uniformity of powder blend 11. After study of flow rate it conclude that powder blend exist optimum proportion that leads to maximum flow rate. So the result showed that the powder have good flowing property which does not cause affect the process of tablet punching.

B. Thickness

The thickness of Naagdon tablet was found to be 1.2± 0.1cm. It is depends upon the size of die and punches or a function of die fill and compression force.



Fig 16: tablet deffect

C. Weight and Variation

The weight of 20 tablets was measured and it was found to be 0.397±0.012 to 0.399±0.034 for all formulations respectively. All the Naagdon tablet passed weight variation test as the average percentage weight variation was within the USP limits of ±5%.

D. Hardness

The hardness of conventional Naagdon tablet was found to be 4.31±0.21kg/cm2 to 5.21±0.033 for clove and cinnamon containing formulations. Mannitol containing formulation code showed more friable and less hardness than lactose as diluent. It is depend upon the compression force of punching machine and showed that it is sufficient for tolerating mechanical strength. Tablets showed sufficiently hard to resist breaking during packaging, shipment, and normal handling.

E. Fribility

Friability of all formulations was found to be0.14±0.045 to 0.31±0.0.12 %.The friability of clove and cinnamon containing tablet was found to be in acceptable limit i.e. less than 1%. There no capping problem occurs in the tablets so it could be considered for commercial use. It produced no loss during shipping process 14 .

F. In-vitro Drug Release

The in-vitro drug release of eugenol from all Naagdon tablets in 0.1 HCL was found to be 85.34 to 90.23%respectively in 1 h. The release of eugenol as a therapeutic agent from Naagdon tablet is produce maximum release in F1 formulation due to presence of more amount of eugenol

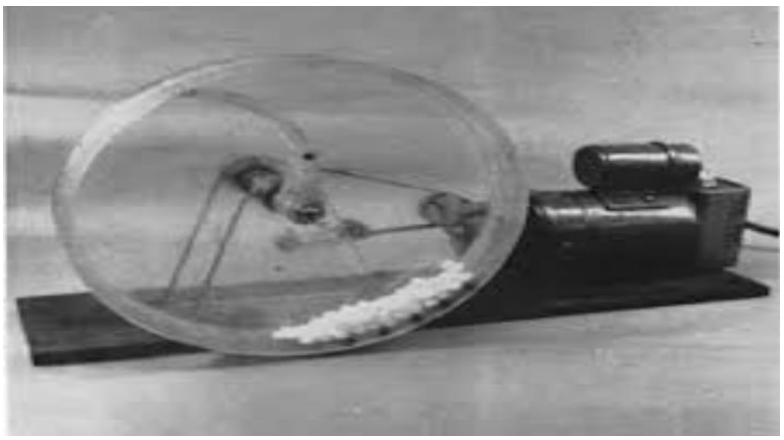


Fig 17: friability tesrer

X. USES: OF NAAGDON TABLET FORMULATED BY WET GRANULATION METHOD

To cure excessive bleeding

To prevent bleeding during piles

The infection happen during any bleeding can be cure It helping to stop the blood flow to speed up recovery Another use od naagdon tablet to cure diabetes mellitus helpfull for asthmatic patient ,persistent coughing



Fig 18: tablet

XI. CONCLUSION

From the above study, we conclude that the Naagdon tablets were prepared by wet granulation method and gave satisfactory and acceptable result. Conventional tablet of naggdon shows immediate drug release due to wet granulation tablet. The formulation containing Naagdon could be more benefical as an analgesic due to the tablet. From the above research work it was concluded that herbal Naagdon tablet prepared in the form of cost effective tablet to minimize patients compliance in regarding supressing side effects and enhancing positive

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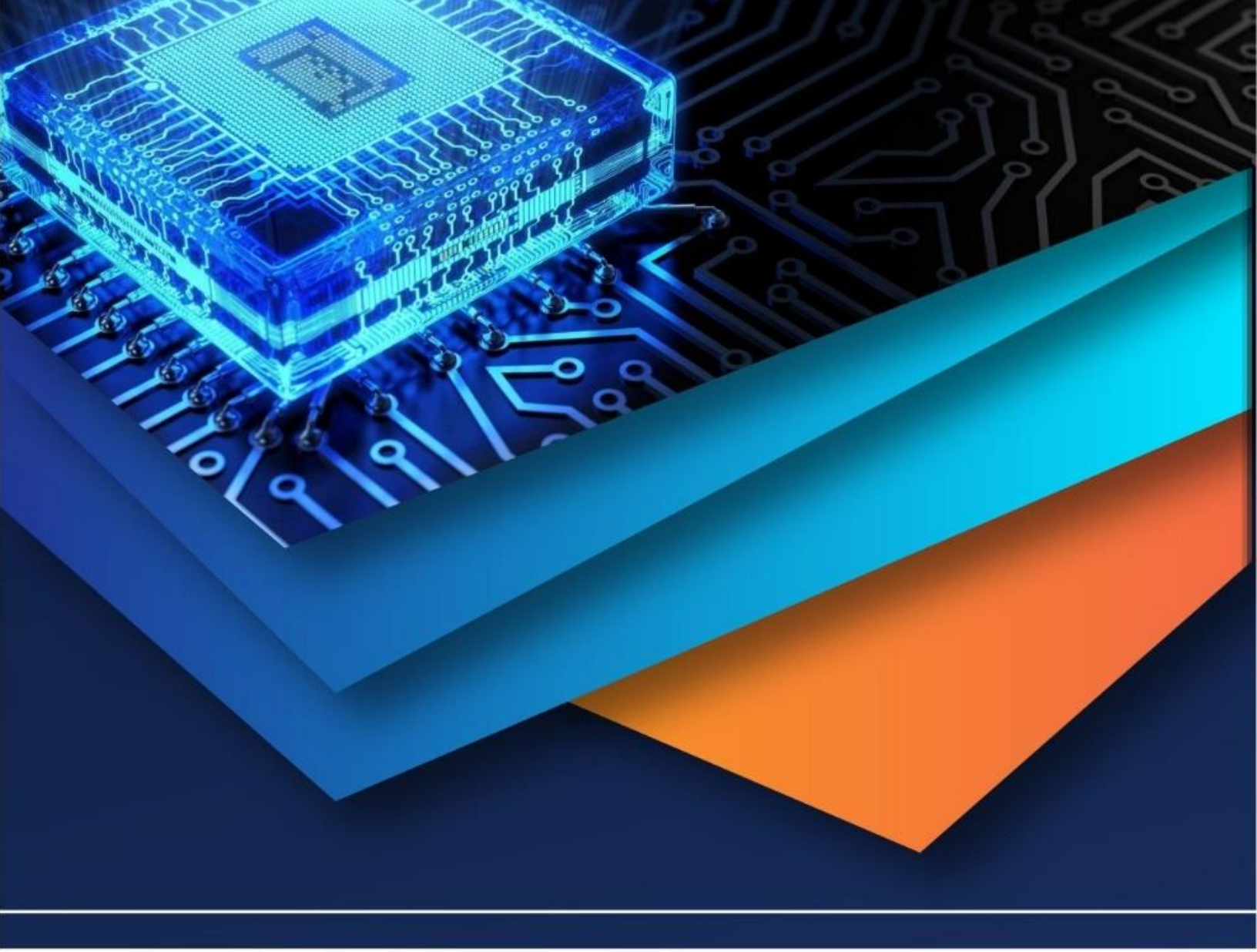
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