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Review Paper

Review On Polyherbal Antifungal Dusting Powder

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ABSTRACT

The creation and evaluation of of an antifungal polyherbal dusting powder was the main purpose of the project. The dusting powder was built for the present moment inquiries. Using a mortar and pestle, all the materials were paired to create the dusting powder. The prepared dusting powder was subsequently examined for a number of factors, including physical attributes (color, odor, grittiness, appearance), solubility, Ph, micromeritic properties (particle size, surface area, density (bulk, tapped), angle of repose, Carr's index, Hausner's ratio, and volume (bulk, tapped). Its antimicrobial activity was evaluated against microorganisms such as Staphylococcus aureus and Escherichia coli.For the microbiological test using the well diffusion cup plate method, a mix culture of the two microorganisms mentioned above was employed. The disease-causing capacity induced by various microorganisms was the framework for testing these antimicrobial agents. An adequate dietary medium was used to propagate these kinds of microbes. One gram of powder was dissolved in ten milliliters of water to create the sample. After getting sterilized with autoclave, the sample was moved to the solidified agar medium. After that, the plates were streaked with bacterial culture and allowed to develop for 48 hours at 370 Fahrenheit in an incubator.Following the incubation period, examinations were made of the microorganisms' growth and their zone of inhibition around the formulation. It came out that the formulation worked exceptionally well against pathogenic microbe strains. The primary essential oils revealed massive activity against all microorganisms, including S. aureus and E. coli. We come to the result that the polyherbal dusting powder formulation has good antibacterial effect and ought to be pursued for the treatment in various topical skin conditions..

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INTRODUCTION

Extended exposition to static pressure on a patch of skin, particularly in inanimate individuals, could result in ulcers, which may injure the skin and underneath tissues, causing tissue destruction and ischemia. A pressure ulcer can be summed up as "constant pressure resulting in alteration or deformation impairment." Decubitus ulcers and pressure sores can also be referred to as painful bedsores. Bedsores are frequently observed on the shoulders, ankles, heels, back of the head, elbows, buttocks, and tailbone spine. Bedsores are caused by pressure, friction, shear, and wetness

The National Pressure Ulcer Advisory Panel and the European Pressure Ulcer Advisory Panel categorise bedsores into the following standardized classifications:

• Stage I (Non-blanchable erythema): In normal-skewed individuals, the affected area of skin turns red; in darker-skinned normal people, it grows purple or blue. Under pressure, stage 1 pressure ulcers never turn white.

• Stage II (Partial thickness): The rest of the skin's innermost layer, the dermis or epidermis, may be injured in stage II pressure ulcers, which leads to skin loss. The ulcer might appear discomforting or erupting.

• Stage III full thickness skin loss: In this stage, the skin's thickness completely gets diminished. The underlying tissue gets injured, while the muscles and bones are unscathed. The ulcers show up as deep cuts with a hollow himself.

• Stage IV (Full thickness tissue loss): This is the most serious and because of the severe skin damage (tissue necrosis), the cells in the vicinity start to die. In some cases, the muscles, bones and joints can be damaged very badly. Patients are having highest chances of getting an infection that can be fatal.

Bedsore management is achieved by relieving the pressure, cleaning the wound, applying dressings, using topical creams, addressing incontinence, removing dead tissue, taking any required antibiotics, adjusting the diet, and discussing surgical options

Dusting Powder

Dusting powder is a powder that is applied to the skin or to wounds to reduce irritation or to absorb of moisture. A dusting powder is a mixture of finely powdered substances to be applied externally for the treatment of skin wounds, burns and surgical interventions. In addition to helping to relieve congestion and provide a cooling effect, the powder bases absorb the secretions and encourage a drying action.

Figure No .1 Dusting powder

Properties of Powder

- It should to be continuous.
- It ought to aggravate you.
- It should spread smoothly and flow effortlessly.
- It ought to comply to the skin when rubbed.
- It should be able to absorb and repel contaminants.

Types of Dusting Powder

There are two types of powders used in body cavities

Medicated powder:These are particularly useful for conditions affecting the skin's surface. They have to be free of pathogens. Certain mineralogy must be adequately sterilized because they may be contaminated with gas gangrene, tetanus spores, etc. Furthermore, the label must state that they should not be placed on areas with damaged skin or open wounds.

Surgical powder : These are used in the body's deep and major wounds due to burns and umbilical cords of the infanta. These need to be sterilized before application.

Herbal medicine: The earliest known type of treatment is herbal medicine, sometimes known as herbalism. All societies have utilized herbs for their medicinal or healing properties throughout history. Herbs have chemical components that have therapeutic effects on the body.5 India is a rich source of medicinal herbs and it has been found that many essential oils and extracts are used in traditional systems of medicine such as Ayurveda, Unani, and Siddha. Plant-based natural products like flavonoids, terpenes, and alkaloids are widely studied and used for their various pharmacological applications such as anti-inflammatory, wound healing, antibacterial, antipyretic, analgesic activities, etc.

Compounding Methods

1. Grinding
2. Weighing
3. Mixing
4. Wrapping

Advantages

- Possess better chemical stability compared to liquid formulations.
- More convenient to transport than liquid dosage forms.
- Well-suited for use in young children and elderly individuals.
- Simple to apply directly onto wounds.
- Cost-effective option.
- Provides a quick onset of action.

Disadvantages

- Challenging to preserve powders with hygroscopic or aromatic components from degradation.
- Inappropriate for drugs that degrade under standard atmospheric conditions.
- Prone to physical instability over time

INGREDIENT:

1) **Starch :** It functions as an adsorbent within the mixture. It is the insoluble residue that remains after an enzyme partially solubilizes granular starch. This can be used as the only ingredient or combined with other substances like talc to make dusting powder.

Figure No .2

2) Talc : It is a clay mineral made of magnesium silicate that has been hydrated. Baby powder is a common term for powdered talc, which is frequently used in conjunction with corn starch. This material has lubricating and thickening properties. Additionally, it serves as an adsorbent.

Figure No .3

Kaolin : It belongs to the class of industrial minerals and is a clay mineral. To dry or soften the skin, kaolin is used topically. It serves as an adsorbent as well

Figure no .4

Zink oxide: It is frequently used as a stabilizer, dusting agent, and releasing agent. It serves as a dry lubricant in dusting powders to absorb moisture and stop chafing.

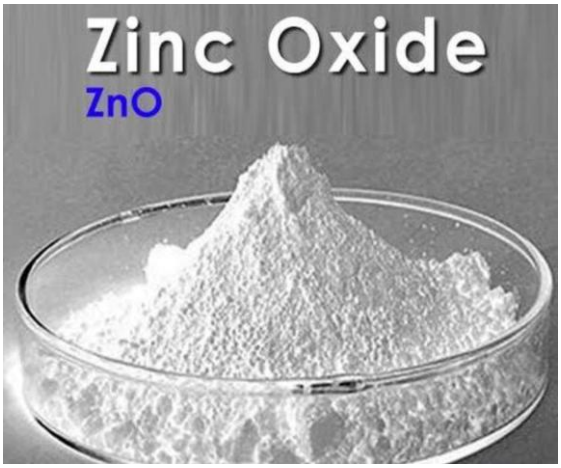

Figure No. 5

Argemone Mexicana: Argemone mexicana, also known as prickly poppy or Mexican poppy, has been studied for its potential antifungal properties. Some research suggests that extracts from this plant exhibit antifungal activity against various fungal strains, including Candida albicans and Aspergillus niger. However, the specific mechanisms of action and the effectiveness of these extracts may vary depending on factors such as the extraction method and the concentration used. Further research is needed to fully understand and harness the antifungal potential of Argemone Mexicana

Figure no 6 .Argemone Mexicana

MATERIAL AND METHODS:

Formula:

Sr.no	Ingredient	Quantity
1)	Starch	5gm
2)	Talc	10gm
3)	Kaolin	10gm
4)	Argemone Mexicana L	20gm
5)	Zink oxide	5gm

Procedure :

1. collect the roots of the argemone mexicana and keep it for shed dry for 2 days.
2. Then after drying transfer into blender and blend well.
3. weight given quantity of ingredients mentioned in the formulae.

4. Transfer it to a clean mortal- pestle. Triturate all the ingredients until fine powder is obtained. Pass this powder through the sieve 52#.

Evaluation of dusting powder

Physical characteristics- The colour, odour and appearance of the powder is evaluated by simple visualization.

pH - pH is a measure of the acidic or basic nature of the formulation. The pH of dusting powder is determined to avoid the irritation to the skin.

Particle size- The particle size of prepared powder was determined by using microscope and sieve analysis.

Abrasiveness- It was studied by rubbing the powder on a surface and then studying the effect on the surface using microscope.

Bulk density (BD) and tapped density (TD) - The powder was passed through a no. 18 sieve into a pre-weighed 25 ml graduated cylinder with 0.5ml markings. The bulk volume was measured after manually tapping the cylinder two times on a flat table top surface. The tapped volume was measured with the tap density tester after tapping in increments of 500, 750, and 1250 taps with 250 drops per minute.

Bulk density = Bulk mass/ Bulk volume

Tapped density = Mass of granules/ volume of granules.

Angle of repose- The flow properties of powders can be studied by measuring angle of repose. It was determined by the funnel method. The funnel was fixed in place, 4cm above the bench surface. After the cone from 5g of sample was built, height of the granules forming the cone (h) and the radius(r) of the base were measured. The angle of repose was calculated as follows:

$$\text{Angle of repose} = \tan^{-1}(h/r)$$

Where, h= height of the powder cone r= radius of the powder cone

Carr's index- The bulk and tapped densities were used to calculate Carr's compressibility index to provide measure of the flow properties and compressibility of powders. Carr's index = Tap density- bulk density/tap density * 100

Hausner ratio- It is indicative of flow properties. It is derived property from bulk and tapped density. Lower the Hausner ratio is indicating better flow whereas higher ratio indicates poor flow of granules. Hausner ratio is calculated by the following formula:

Hausner ratio = Tap density/ Bulk density

Moisture content- Percentage of moisture content is calculated by using formula: % Moisture = Initial weight- final weight/ initial weight * 100

Antimicrobial activity The antimicrobial activity of dusting powder was tested by well- diffusion using cup plate method against Staphylococcus aureus and Escherichia coli.

Well- diffusion using cup plate method Agar medium was prepared and autoclaved. Inoculums was added in 250 ml of the media under aseptic condition and then media was poured in Petri plates. After the medium was solidified wells were bored with help of sterile borer.

Sample preparation About 1gm of powder was dissolve in the distilled water until it converts into a solution. After that, the bores on each plate were filled completely with the solution. In clockwise manner, the labeled wells were incubated at 32-

370C for 48 hours. The sensitivity of test organism to each antibacterial agent was indicated by clear zones of inhibition around the well. The antimicrobial activity was determined by measuring the diameter of zone of inhibition.

RESULT AND DISCUSSION:

1. Physical characteristic – The physical characteristic of the powder was evaluated. The color of powder was white with characteristics odour and smooth appearance.
2. PH of the formulation – The ph of the dusting powder was determined by digital ph meter. 1gm of powder was dissolved in 100 ml of distilled water and the ph was measured. The ph was found to be acidic.
3. Particle size – The particle size of the powder was found in the range was found to be 0.126 mm [126 microns].
4. Abrasiveness – The powder was foud to be absence of grittiness.
5. Bulk density – The bulk density of powder was found to be 0.35g/cm3
6. Tap density – The tap density of the powder found to be 0.55g/cm3
7. Angle of repose – The angle of repose of powder was found to be 250
8. Carr's index- The Carr's index of the powder was found to be 24%
9. Hausner index- The hausner index of the powder was found to be 1..
10. Moisture content- The moisture content was found to be 1%w/v

Result Table

Sr.No	Evaluation test	Result
1)	Physical characteristic	Smooth appearence
2)	Ph	Acidic
3)	Particle size	0.126mm [126micron]
4)	Abrasiveness	Absence of grittiness
5)	Bulk density	0.35 g/cm3
6)	Tap density	0.55 g/cm3
7)	Angle of repose	250
8)	Carrs index	24%
9)	Hausner ratio	1
10)	Moisture content	1 % w/v

CONCLUSION

The present study was successfully carried out to formulate and evaluate a polyherbal antimicrobial dusting powder using suitable herbal and excipient ingredients such as Argemone mexicana, starch, talc, kaolin, and zinc oxide. The prepared formulation was evaluated for various physicochemical and micromeritic parameters including particle size, bulk density, tapped density, angle of repose, Carr's index, Hausner's ratio, moisture content, pH, and physical characteristics. The results indicated that the powder possessed good flow properties, acceptable particle size, low moisture content, and smooth texture without grittiness, making it suitable for topical application.The well diffusion cup plate method was used to gauge the formulation's antibacterial performance against Gram-positive Staphylococcus aureus and Gram-negative Escherichia coli bacteria. Effective antibacterial effectiveness was shown by the formulation's prominent zones of inhibition against both species. Alkaloids, flavonoids, and

phenolic compound compounds are examples of phytoconstituents that contribute to the antibacterial capabilities of essential oils and herbal components.Therefore, topical use of the manufactured polyherbal dusting powder can be recognized beneficial in the treatment of skin infections, wounds, ulcers, and dermatological conditions connected to moisture. Polyherbal formulations are safe, inexpensive, and efficient equivalents for synthetic antibacterial agents, according to the study's data. To create its therapeutic efficacy and safety for commercial formulation, additional research should be conducted, including stability tests, determining antifungal activity, and clinical evaluation.

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