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Formulation and Evaluation of Herbal Granules using *Citrus lemon peel* and *Azadirachta Indica* showing Antifungal activity

Miss Sherekar P.P. * Assistant Professor, Department of Pharmacognosy,
A.M.C.P., Peth-Vadgaon

Shubham Shivangekar, Poonam Shinde, Tejas Talekar.

Corresponding Author e-mail- sherekarpu@gmail.com,7058402653

Abstract:

Aim: The main aim of present work is to develop herbal antifungal formulation by using latest technique and financially cheap and easily affordable for lay man as compare current dosage forms. Herbal granules preparation using lemon peel and neem leaves. Current study suggests that both drugs give antifungal effect.

Objective Wet granulation techniques used to prepare herbal granules which will be cheaper and less time consuming as compare to other dosage forms like tablet, capsules, syrups. The most common pathogen causing systemic fungal infection are candida albicans and aspergillus spp.

Material and Methods: Lemon peel and neem leaves crushed and powdered. By using binder and distilled water and excipient made pest and dough was prepared and granules were prepared by using wet granulation method.

Result & Discussion: The final result is that both the API Citrus limon and Azadirachta Indica gives antifungal activity against bacteria which causes fungal infection. The final prepared gives antifungal activity. This preparation is not time consuming as compared to other dosage forms and also economical for commercialization on large scale basis.

Conclusion: This research work focus on wet granulation technique is used, the process which is cheaper and less time consuming as compared to production of tablets, capsules and syrups. Hence, this formulation can serve as an ideal for commercialization on large scale and an inexpensive therapy as compared to currently available formulations in the market.

Keywords: Antifungal, Neem leaves, Lemone peel.

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Introduction:

In India very huge heritage of traditional systems of medicines.

Now a days most worldwide problem is fungal infection on skin of human beings. From ancient times Ayurveda system of medicine most popular in all over world. In the ayurveda different herbal crude drugs used to treat various diseases. Most of domestic remedies from traditional ayurveda system very useful for various diseases. In modern era different latest techniques now implement to manufacture new dosage formulation. Present work is regarding antifungal herbal formulation by using different herbal crude drug extract. One of the modern internal dosage forms i.e. herbal grannules are prepared by using various antifungal herbal medicines. Herbal drug therapy approach is very valuable therapy to overcome side effects of allopathic treatment. Many more herbal antifungal crude drugs are available Neem lemon peels are useful for fungal infection on skin.

Material and Methods:

Collection of plants material:

We collect the *Citrus lemon* (lemon peel) from lemon of medicinal garden and also *Azardiraccta Indica* (Neem leaves) are collected from plant in medicinal garden of college. Then washed and dried for 10-15 days in shade. Then shade dried plant material crushed and passed through 50-mesh sieve, put it in a 2000mL round- bottom flask, add 1000mL of distilled water, extract it with a volatile oil extractor for 8 hours, extract the volatile oil with petroleum ether, add anhydrous sodium sulfate to the extract to dry, filter, and evaporate. Neem powder is an herbal green powder made by crushing the sun-dried leaves of the *Azadirachta indica* (Neem).

Preparation of Grannules (By Wet Granulation technique):

Required quantity of both the drugs were taken. The other ingredients were mixed and this mixture were taken in the mortar pestle. Evenly mixed and distilled water and binder i.e. starch was added to make soft dough. The dough is pass through sieve no. 40 and subsequently this material was pass through the sieve no.20. It was final grannules, then grannules were dried in oven at 70°C for 20 minutes. Dried grannules are collected from oven and carried out for different evaluation test. The final product looks like greenish brown in colour and has a granule of small evenly sized particles.

Formulation Table:

Sr.No.	Ingredients	Quantity (in gm)	Role
1	Lemone peel Powder	6	API (Antifungal effect)
2	Neem leaves powder	6	API (Antifungal effect)
3	Starch	4.9	Disintegrant
4	Gum Tragacanth	3.6	Binder
5	Sucrose	5.5	Sweetener
6	Methyl Paraben	0.6	Preservative
7	Turmeric	2.1	colorant
8	Lactose	6.3	Diluent
9	Orange oil	4	Flavoring Agent
10	Distilled Water	Q.S.	Vehicle

Evaluation of final Product:**Angle of Repose:**

Angle of repose was measured by using fix fennel method.

The radius of the base was measured. The angle of repose (θ) was calculated.

Formula for angle of Repose

$$\tan \theta = h/r,$$

Where, θ = Angle of repose,

h = Height of the cone,

r = Radius of the cone base.

Bulk Density:

It was measured by using 100 ml cylinder. unsettled apparent volume, V_o , was read.

Formula for bulk density

$$\rho_b = M / V_o$$

Where, ρ_b = Apparent bulk density,

M = Weight of sample,

V = Apparent volume of powder

Tapped density:

It was calculated by measuring final tapped volume (g/mL)

Formula for Tapped Density

$$\rho_{tap} = M / V_f$$

Where, ρ_{tap} = Tapped density,

M = Weight of sample,

V_f = Tapped volume of powder

Loss on drying:

Loss on drying was determined by placing final herbal grannules product in oven at 105°C

Result and Discussion:

Lemon peel extract and Azardiraccta indica both crude drugs are chosen for there antifungal activity against skin fungal infection caused by common fungi. This led to an attempt to create herbal antifungal grannules. This formulation was prepared and evaluated for the physical properties. This formulation economically beneficial as well as easy to manufacture as compare to other dosage forms. So it become ideal formulation for commercialization on large scale as compare to currently available market preparation of Antifungal effect.

Conclusion:

This research work focus on wet granulation technique is used, the process which is cheaper and less time consuming as compared to production of tablets, capsules and syrups. Hence, this formulation can serve as an ideal for commercialization on large scale and an inexpensive therapy as compared to currently available formulations in the market. Wet granulation techniques used to prepare herbal grannules which will be cheaper and less time consuming as compare to other dosage forms like tablet, capsules, syrups. The most common pathogen causing systemic fungal infection are *candida albicans* and *aspergillus spp.*

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