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Expression and Evaluation of Polyherbal Tablet

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ABSTRACT
Herbal tablet expression dates back to ancient civilisations, where traditional knowledge and natural resources were employed to create effective remedies. They used a combination of powdered plant substance, natural binders and manual compression techniques to formulate the tablets. Historical records from regions similar as India, China, and the Mediterranean reveal different approaches to herbal tablet preparation. Herbal tablet surfaced as a safe, effective, and accessible substitute to synthetic medicine. This study focuses on the expression and evaluation of a herbal tablet prepared using Liquorice (Glycyrrhiza glabra), Ashwagandha (Withania somnifera), Amla (Phyllanthus emblica), and Tulsi (Phyllanthuus emblica) through wet granulation method. The herbs were named for their synergistic properties, including anti-inflammatory, anti-oxidant, and immune-boosting effects. The wet granulation method was employed to ensure uniformity, improve compressibility and achieve solid tablet structure. The set tablets were subordinated to standard physicochemical evaluation parameters such as hardness, friability, weight variation, and disintegration. All parameters complied with pharmacopeial norms, indicating the quality and stability of the expression. The result demonstrated that the herbal tablet expression is effective in delivering the combined remedial benefits of the selected herbs. This study highlights the future of integrating traditional herbal knowledge with ultramodern pharmaceutical methods to produce standardised, efficacious, and patient friendly herbal tablets. Advanced exploration involving clinical evaluation will strengthen the utility of this expression in the remedial operations.

KEYWORDS: Polyherbal tablet, immunity booster, herbal medicine, wet granulation

I. INTRODUCTION

Tablets are defined as solid medication intended for oral administration, each containing a single dose of one or further active constituents. Tablets are prepared by compaction and contain medicine and expression complements. Plants are always an exemplary source of medicine. In fact, numerous of the presently available medicine were deduced either directly or laterally from the shops. A polyherbal tablet is a tablet that contains two or more different types of herbs.

Polyherbal tablets are frequently used to treat a variety of conditions, including:

- Colds and coughs
- Flu
- Digestive problems
- Headaches
- Arthritis
- Stress
- Anxiety
- Insomnia

Secondary metabolites of plant origin are molecules or macromolecules biosynthesized in plants, including alkaloids, glycosides, tannins, lignans, etc. that have a variety of salutary remedial uses.Tablets are an oral delivery system generally utilised for medicinal and nutraceutical products.The effective phytochemicals of individual plants are not sufficient to achieve salutary effect therefore, the combination of several herbs in specific proportions will give the ideal remedial effect. Multiherbs medication contains two or more herbs with different botanical compositions these herbs have analogous or different remedial potential and together provide ideal effects in the treatment of mortal conditions. Herbal preparations made from plants are effective in low doses and safe in high doses due to the wide range of treatments available. Improper use has fewer side effects, but it is extremely popular.16 The tablets was formulated using herbal crude medicine withania somnifera(ashwagandha) Glycyrrhiza glabra (liquorice), Ocimum tenuifloru(tulsi), Phyllanthus emblica(amla) in powdered form. The polyherbal expression contains two or more herbs with different phytoconstituents possessing analogous or different remedial potential have been collectively producing

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desirable effects. It is important to note that polyherbal tablets are not regulated by the FDA in the same way as tradition specifics. This means that there is lower assurance of their safety and efficacy. It is also important to note that polyherbal tablets can contain a variety of different herbs, and it can be difficult to know how they will interact with each other or with other medications you are taking. If you are considering taking polyherbal tablets, be sure to talk to your doctor first. They can help you assess the risks and benefits and make sure that polyherbal tablets are right for you.Polyherbal tablet is expected to raise the efficacy and potency of expression, reduction of side effects, and increase of life span.

II. MATERIALS AND METHODS

A] Plant Materials: - The powdered form of herbs Ashwagandha (Withania somnifera), Liquorice (Glycyrrhiza glabra), Tulsi (Ocimum sanctum), Amla (Phyllanthus emblica). These medicine were obtained from the medical store, local store market of Wagholi,Pune. The constituents used was of a laboratory quality.

B] Excipients: - Excipients Magnesium Stearate, Starch, Lactose, Talc, acacia gum taken from Genba Sopanrao Moze College of Pharmacy, Wagholi,Pune. These excipients were used from the laboratory store of the college.

C] Expression and Method of development: - Polyherbal chewable tablets containing Withania somnifera (Ashwagandha), Glycyrrhiza glabra (Liquorice),Ocimum sanctum(Tulsi),Phyllanthus emblica (Amla) were formulated by technique of wet granulation method. Excipients ingredient such as starch, talc, magnesium stearate having properties of binder, glidant, lubricant respectively.

Table 1: Expcipients List

Sr. No.	Excipients	Role
1]	Starch	Binder
2]	Magnesium stearate	Lubricant
3]	Talc	Glidant

Table 2: Ingerdients List

Sr. No.	Ingredient	Biological Source
1]	Ashwagandha (Withania somnifera)	Dried roots and stem bases of Withania somnifera.
2]	Liquorice (Glycyrrhiza glabra)	Dried, peeled, unpeeled, roots, rhizome of Glycyrrhiza glabra Linn.
3]	Tulsi (Ocimum sanctum)	Leaves of Ocimum sanctum
4]	Amla (Phyllanthus emblica)	Fresh and dried fruit of emblica officinalis

Experimental working: -Herbal constituents and the excipients were used to formulate the tablet by wet granulation method. The wet granulation method has been extensively adopted for formulating these herbal tablets, as it ensures uniformity, compressibility, and stability of final product.

WET GRANULATION METHOD

Wet granulation is the most common method for manufacturing of oral lozenge forms. It is

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convenient, flexible, extensively habituated method.

STEPS INVOLVED ARE,
1]Weighing of constituents
Each component in the expression were counted accurately.
2] Sieving
The constituents were screened through the sieves to ensure uniform mixing and enhance rate of dissolution.
3]Premixing
The constituents present in the expression were completely mixed together with some exception of the magnesium stearate and talc.
4] Addition of binder
The acacia gum solution was added gradually in the expression.
5]Sieving of the wet mass
The wet mass was sieved to gain granules.
6]Drying of wet mass
The granules were dried in vacuum dryer.
7]Sieving
The granules were rescreened to exclude the bigger granules after drying and then were placed in the desiccators for storage.
8]Final Mixing
Magnesium stearate along with talc were combined with the granules prior to punching.
9]Punching
On a single rotary punching machine, tablet compresses with the proper compressing pressure, powder mixtures were compressed to tablets.

EXPRESSION TABLE

Table 3: Expression table

Sr.No.	Constituents	Quantity (mg) per tablet	Role
1]	Liquorice (Glycyrrhiza glabra)	100	Active ingredient
2]	Ashwagandha (Withania somnifera)	50	Active ingredient
3]	Tulsi (Ocimum sanctum)	50	Active ingredient
4]	Amla (Phyllanthus emblica)	50	Active ingredient
5]	Starch	30	Binder
6]	Magnesium stearate	10	Lubricant
7]	Talc	10	Glidant

EVALUATION

The evaluation studies were performed before formulating the tablets, the powders were subordinated to following evaluation parameters.

Pre-compression studies

1] Angle of repose: - The funnel technique was used in order to calculate angle of repose. The powder was passed through the funnel and was calculated by using the formula

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Angle of repose (θ) = tan-1 height/ compass

Here, θ = angle of repose, height of the pile is denoted as h and radius is denoted as r.

2]Bulk density: - Bulk density was determined by passing a weighed quantity of powder into a graduated measuring cylinder and determining the volume occupied. The bulk density is determined by following formula,

Bulk density (BD) = weight of powder/volume occupied by powder

3] Tapped density: - It was determined by placing a known weight of powder in a measuring cylinder. The cylinder was allowed to fall under its own weight onto a hard surface of 10 cm at two seconds interval. The tapping was continued till no further change in volume was noted.

Tapped density (TD) = weight of powder/volume occupied by powder

4]Carr's index and Hausner's ratio

Hausner's ratio and Carr's compressibility index are related to interparticle friction and can be used to determine flow properties of the powder. It was calculated by the following formula.

- Hausner's ratio= TD/BD
- Carr's compressibility index= (TD - BD)/ TD X 100

Where, TD= Tapped density, BD= Bulk density

Post compression studies

1] Organoleptic properties

The properties of the tablet like physical appearance of the tablet, uniformity of colour, presence of odour, taste are examined.

2]Thickness

The Vernier Calliper was used to determine and calculate the tablet size in millimetres. In all of the instance, the average value of ten determinations was noted.

3]Friability

When a tablet loses weight in a package or container due to the removal of tiny particles from its outer layer of tablet, then it is termed as 'friability'. The tablet was weighed and placed in the rolling friabilator. Together 5 tablets were placed and the average speed of 25 rpm was set.The test is done to assure that tablets capacity to tolerate vibrations during manufacturing, operating, shipment, and transportation. The percentage friability was estimated by using the formula,

% friability = [W0-Wt/W0] × 100

Where, W0 = initial weight, Wt = final tablet weight

4]Weight variation test

The 20 tablets were taken weighed separately and collectively.The average weight of all the tablets was determined from their combined weight. The mean weight was contrasted with each tablet weights. The weight variation's percentage disparity must stay within allowed ranges.The formula given below was applied for estimating the percent difference:

Percentage difference = [(Individual weight - Mean weight) / Mean weight] × 100

5]Hardness test

The breaking strength of a tablet indicates the hardness of the tablet. This may be brought on by the powder's poor flow characteristics or moisture content. The hardness of the tablets was examined using a Monsanto hardness tester.

6]Disintegration test

The disintegration test was performed to calculate the time taken by the tablet to breakdown. The remedial effect of the tablet depends on the disintegration time of the tablet. The disintegration test was performed using disintegration apparatus. The apparatus consisted of a basket rack, a water bath, an arm to move the basket, and a display. The device uses 6 glass tubes open at the top and 10 mesh screens at the bottom. One tablet was placed in each tube and the basket rack was positioned in beaker containing 1N HCL which was acting as gastric fluid at 37±0.5 °C. The basket was moved up and down by the arm at a frequency of 28 to 32 cycles per minute. According to the test tablet must disintegrate and all the particles must pass through the 10-mesh screen in the specified time. If any residue remains, it must have a soft mass.

III. RESULT AND DISCUSSION

The tablet expression was prepared by wet granulation method using withania somnifera, glycyrrhiza glabra, Ocimum sanctum, Phyllanthus emblica and excipients magnesium stearate, lactose, starch, talc, acacia gum.

The evaluation of tablet, pre compression and post compression studies were found satisfactory when compared with the former studies performed on the tablet expressions. The results of the evaluation studies are mentioned in tables below. Specially the antioxidant, adaptogenic, anti-inflammatory, immune-boosting properties are

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retained in the tablet form, making them suitable for use.

Table 4: Parameters table

Sr No.	PARAMETERS	RESULT
1	Angle of repose {θ}	25 ± 0.18
2	Bulk density {g/ml}	0.49± 0.23
3	Tapped density {g/ml}	0.65± 0.31
4	Carr's index {%}	23.31 ± 1.04
5	Hausner's ratio	1.30 ± 0.021

Sr. No.	PARAMETERS	RESULT
1]	Colour	Dark Brown
2]	Shape	Round
3]	Odour	Sweet and woody
4]	Thickness	4.5mm
5]	Friability test	0.56 %
6]	Weight variation test	7.5 %
7]	Hardness test	6.5 ± 0.32
8]	Disintegration test	12 min

IV. CONCLUSION

The experimental methodologies reviewed demonstrate the feasibility and effectiveness of the wet granulation method in developing high-quality herbal tablets containing Ashwagandha (Withania somnifera), Liquorice (Glycyrrhiza glabra), Tulsi (Ocimum sanctum), and Amla (Phyllanthus emblica). This process ensures the uniformity and compressibility of the tablets and also preserves the bioactive properties of herbal constituents and provide remedial efficacy. The evaluation parameters meet the pharmacopeial norms and suggest that such expressions can effectively address a wide range of health conditions, including stress, immunity, inflammation-related disorders. The binder enhances the biocompatibility of the tablet. Despite the promising outcomes, certain challenges remain, including ensuring batch-too-batch consistency, long-term stability, and large-scale production. Further exploration should on addressing these challenges through advanced expression technologies, as well as conducting clinical trails to validate the safety and efficacy of these herbal tablets.

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REFERENCES

[1]. Kumar, T. Sampath, et al. "Expression and Evaluation of in vitro antidiabetic Polyherbal tablets form some traditional used Herbs." J Phytopharmacol 10.3 (2021): 173-179.

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[2]. Mahapatra, Santosh Kumar, and Seema Verma. "Expression and evaluation of polyherbal tablet for better remedial efficacy." Research Journal of Pharmacy and Technology 16.2 (2023): 835-838.
[3]. Majumder, Pulak, and M. Paridhavi. "Physiocochemical standardization and expression development of poly-herbal tablet for diabetes." British Journal of Pharmaceutical Research 12.3 (2016): 1-17.
[4]. Kolhe, ROHINI C., and RAJESH Y. Chaudhari. "Development and Evaluation of Antidiabetic Polyherbal Tablet Using Medicinal Plants of Traditional Use." Int. J. Curr. Pharm. Sci 15 (2023): 17-21.
[5]. Mahran, Mohamed, et al. "Fast disintegrating tablets of spray dried poly-herbal extract: a promising hypoglycemic and diabetic wound healing activity." Journal of advanced Biomedical and Pharmaceutical Sciences 3.1 (2020): 23-30.
[6]. Kar, Nihar Ranjan, et al. "Polyherbal Tablet: Expression, Evaluation, and Anti-Diabetic Activity of Ethanolic Extract of Leaves of T. Portulacastrum and a. Marmelos." Community Pract 20.10 (2023): 73-81.
[7]. Gaikwad, Vinayak Dasharath, Priyanka A. Thorat, and Satara Ghogaon. "Expression and Evaluation of Poly Herbal Chewable Tablets from Ayurvedic Constituents having Cough Relieving Activity."
[8]. Maurya, Harikesh, and Tirath Kumar. "Expression, standardization, and evaluation of polyherbal dispersible tablet." Int J App Pharm 11.1 (2019): 158-67.
[9]. Prajapati, Disha, Madhavi Patel, and Abhay Dharamsi. "Development and evaluation of a polyherbal tablet for polycystic ovarian syndrome (PCOS)." (2022): 161-174.
[10]. Gohel, Hitesh, et al. "A detail physicochemical investigation of a polyherbal expression-Cutisora tablet." International Journal of Research in Phytochemistry and Pharmacology 3.3 (2013): 142-148.
[11]. Kinjal, Prajapati, et al. "EXPRESSION AND EVALUATION OF POLY HERBAL ANTI INFLAMMATORAY TABLET." (2022).
[12]. Shingala, H., Rangpariya, A., Rupapara, H., Parmar, A., & Kotadiya, M. (2023). EXPRESSION, DEVELOPMENT AND EVALUATION OF POLYHERBAL ANTI UROLITHIATIC TABLET BY WET GRANULATION METHOD FOR ANTI-UROLITHIATIC ACTIVITY.
[13]. Annappan, Umesh, M. V. Kumudhavalli, and Kumar Mohan. "Development and Statistical Optimization of Polyherbal Tablets Containing Indigenous Plant Extracts." International Journal of Advancement in Life Sciences Research 7.3 (2024): 98-108.
[14]. Mane, S. R., Patil, C. S., Patil, P. R., Patil, S. S., Piraji, P., Bhosale, P. N. C., & Patil, S. EXPLORING AYURVEDA AND TRADITIONAL MEDICINES: EFFICACY OF POLYHERBAL ANTIDIABETIC TABLETS AND THEIR ANTIOXIDANT PROPERTIES.
[15]. Sengupta, Rupa, and N. Maitreyi Zaveri. "DESIGN, DEVELOPMENT AND EVALUATION OF POLYHERBAL TABLET OF TWO ANTI-ULCER LEAVES."
[16]. Mankar, S. D., Musale, P., Bhawar, S. B., Siddheshwar, S. S., & Dighe, S. B. (2023). Exploring the synergistic effect in polyherbal chewable antacid tablets: expression and evaluation study. Current Issues in Pharmacy and Medical Sciences, 37(3), 153-161.
[17]. RAMYA, DEVI D., G. Rajalakshmi, and S. N. Kanchalochanaa. "Development of colon targeted poly-herbal tablets using tamarind seed polysaccharide." International Journal of Pharmaceutical Research 5.2 (2013): 57.
[18]. Kishor, P., Thirupal, M. V., Nithish, M., Munavar, S. K., Rajakishore, B., Sameer, A., & Balagani, P. K. (2024). PREPARATION AND EVALUATION OF POLYHERBAL TABLETS FOR DIABETES MELLITUS AND IT'S COMPLICATIONS.
[19]. Aslam, M. S., Ahmad, M. S., Mamat, A. S., Ahmad, M. Z., & Salam, F. (2016). An update review on polyherbal expression: A global perspective. Systematic Reviews in Pharmacy, 7(1), 35-41.
[20]. Haligoudar, S., Patil, M., & Balekundri, A. (2022). Expression and evaluation of dispersible tablet from poly herbal churna

for digestive property. Journal of Pharmacognosy and Phytochemistry, 11(1), 123-128.

[21]. Deep, A., Chaurasia, L., Sharma, V., Islam, M., & Kumar, S. (2022). Expression and evaluation of polyherbal anti-diabetic tablet for oral drug delivery system. International journal of health sciences, 6(S4), 8947-8957.