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USING OKRA GUM AS A BINDER IN PHARMACEUTICAL FORMULATIONS

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Abstract

Binders are fundamental in the production of tablets as they give the essential attachment and stability. Nonetheless, synthetic binders are costly and may have adverse effects on the environment. Accordingly, there is a rising interest in tracking down other options, like natural binders. Okra gum is a natural polysaccharide extracted from the pods of *Abelmoschus esculentus*, with magnificent binding properties. This paper surveys flow research on the utilization of okra gum as a binder in drug formulations, including its physicochemical properties, production , and potential applications.

Index Terms

Okra gum, Pharmaceutical industry, Binders, Natural polymers, Excipients, Drug delivery systems, Formulation development, Controlled release, Biodegradable polymers, Rheology, Stability, Compatibility, Characterization, Biopharmaceutical properties, Dissolution rate.

I. INTRODUCTION

his paper guides a stepwise walkthrough about usage of

okra gum as a binder for pharmaceutical formulations. Okra gum is extracted from the units of Abelmoschus esculentus using water or dilute alkali solutions. The extracted gum is then purified using filtration, precipitation, or centrifugation methods. The yield of okra gum differs depending upon the extraction method used.

Okra gum has been studied for its expected use as a binder in different drug details, including tablets, pellets, and microspheres. Studies have shown that okra gum can work on the actual properties of tablets, like hardness, friability, and disintegration time, without affecting the drug release rate. Okra gum has likewise been utilized as a coating material for tablets, giving sustained drug release rate.

One of the difficulties related with okra gum is its variability, depending upon the source of extraction and the extraction technique used. The compatibility of okra gum with other excipients utilized in the formulation is also a concern, and further exploration is expected to examine the interactions.

Empathize: Initial phase in the design thinking process is to understand the consumer or customer. For this situation, the user is the pharmaceutical industry, and the consumer or customer is the patient who will be taking the medicine. We really want to understand their necessities, concerns, and problem areas.

The pharmaceutical industry needs binders that are powerful, safe, and cost-effective. Synthetic binders can be costly and may antagonistically affect the environment, so natural choices are of interest. They additionally need binders that are not difficult to use

in manufacturing processes and don't affect the efficacy of the medication.

Patients need medicine that is safe, effective, and easy to take. They may have concerns about the use of synthetic binders and may prefer natural alternatives. They additionally need a drug that is not difficult to swallow and doesn't have an upsetting taste or texture.

Define: Based on our empathy work, we can define the problem we are trying to solve. In this case, it is to find a natural, effective, and safe binder for use in pharmaceutical

formulations that meets the needs of both the pharmaceutical industry and the patients.

2. PROCEDURE

The use of Okra gum as a natural binder in the drug formulations includes a research facility process that guarantees the quality and viability of the eventual outcome. Here are the general steps to follow to use okra gum as a natural binder.

STEP 1 : *Selection of raw material* : The initial step is to choose good okra pods that are free from any insect or chemical contamination. The pods are then washed and cut into small pieces.

STEP 2 : *Extraction of okra gum*: The okra pods are then made to undergo an extraction process to get the okra gum. The extraction process includes drenching the okra pieces in steaming hot water, blending the combination for a couple of hours, and afterward sifting through the strong particles using a channel material such as a filter cloth or muslin cloth.

STEP 3 : *Preparation* : The extracted okra gum is blended in with other excipients like microcrystalline cellulose, lactose, and magnesium stearate to make a binder that will keep the tablet intact.

STEP 4 : *Precipitation of the obtained Sample :* The concentrated samples were washed with three volumes of Ethanol. The precipitate was collected and rewashed with Ethanol two or three times and the precipitate was collected.

STEP 5: *Drying of the precipitate :* The precipitate was dried initially in sunlight for approximately two hours. Place these samples in a Hot air oven for 1 hour and maintain temperature from 50-60̊ C. The final result obtained will be dry and brown in color which is used as a binder.

STEP 6 : *Formulation of tablets*: The binder is then added to the API (active pharmaceutical ingredient) and other excipients to shape the tablet.

Procedure for Preparation of a Tablet using the above prepared binder:

All the ingredients are weighed accurately . Its being passed through sieve no # 40. Okra mucilage is passed through sieve no # 30. Preparation of Granules and Dry Blend. We are manufacturing the tablet using wet granulation and direct compression method.

The main aim is to check the binding capacity of okra in wet granulation method and direct compression method. A. Granulation was carried out in PLM by adding the above binding solution of okra adopting the following parameter.

- Particle size reduction and sizing.
- Blending.
- Granulation.
- Drying.
- Compression
- Coating
- Packaging.
- Testing of physical properties.

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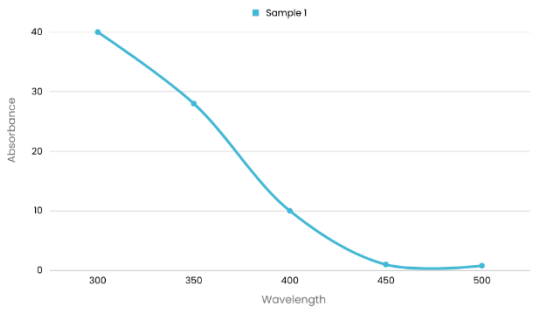
Note : Materials required: Okra pods , filter cloth, hot water, excipients, hot air oven, pharmaceutical manufacturing equipments and instruments like compressor, miller, etc.,



The above image is the graphical representation of the absorbance of our formulated tablet using okra gum as a binder.

Here are some of the benefits of using okra gum as a binder in the pharmaceutical formulation :

Natural origin: Okra gum is derived from a natural source and is considered safe for use in pharmaceuticals. This may not cause any side effects to the patients who are consuming the medicine.

Biocompatibility: Okra gum is biocompatible and does not cause any adverse effects on the body.

Excellent binding properties: Okra gum has excellent binding properties, which makes it an ideal binder for tablets and other dosage forms.

Cost-effective: Okra gum is relatively inexpensive compared to other synthetic binders, making it a cost-effective option for pharmaceutical companies. So it is user friendly.

Overall, okra gum is a promising natural binder for use in the pharmaceutical industry.

3. CONCLUSION

As a conclusion , the use of okra gum as a binder in the drug formulation is a promising option in contrast to synthetic binders. Displaying excellent binding properties and its compatibility with all types of APIs' has been shown. Furthermore, its biodegradability and being eco-friendly make it a safe choice. The availability and minimum expense of okra gum in many regions make it an appealing choice for drug industries hoping to reduce costs and environmental effect. While additional examinations are important to investigate the maximum capacity of okra gum as a binder, the ongoing proof proposes that it has a huge likely in the drug formulations. With proceeded research and development work, okra gum could arise as a significant resource for the business, giving an economical and sustainable option in contrast to traditional synthetic binders.

4. REFERENCES

[1] Der Pharmacia Lettre, 2014, 6 (3):31-39

[2] JN BeMiller, RL Whistler, DG Barbalowm, In: LW Roy, JN BeMiller (Eds.), In Industrial Gums Polysaccharide and their Derivatives (Academic Press, San Diago, 1993) 235–255.

[3]Bajpai, M., & Shukla, S. (2012). Natural binders: an overview. International Journal of Pharmaceutical Sciences Review and Research, 16(1), 64-68.

[4]Bhise, S.B., & Yadav, A.V. (2016). Evaluation of natural binders in tablet formulation: a review. Journal of Drug Delivery and Therapeutics, 6(6), 48-53.

[5]Chaudhari, A.A., & Chaudhari, A.B. (2018). Formulation development of natural binders and its evaluation. Journal of Pharmacy and Biological Sciences, 13(1), 1-9.

[6]Kadam, S.S., & Kadam, S.V. (2013). Natural binders in pharmaceutical dosage forms. International Journal of Pharmacy and Life Sciences, 4(11), 3073-3078.

[7]Rathi, V., & Pathak, K. (2015). Natural binders: a promising approach in drug delivery systems. International Journal of Pharmaceutical Sciences and Research, 6(9), 3547-3555.

[8]Emeje, M., Isimi, C., & Kunle, O. (2010). Evaluation of the binding properties of okra gum in metronidazole tablet formulation. Journal of Drug Delivery Science and Technology, 20(6), 445-449.

[9]Gbenga, O., Lawal, A., & Adedokun, M. (2012). Evaluation of okra gum as a binding agent in paracetamol tablet formulation. International Journal of Pharmacy and Pharmaceutical Sciences, 4(4), 384-386.

[10]Kaur, M.P., Garg, T., Rath, G., Goyal, A.K., & Malik, A. (2013). Okra gum as a binding agent in tablet formulations: a comparative evaluation with hydroxypropyl methylcellulose. Journal of Applied Pharmaceutical Science, 3(9), 34-39.