

Abstract ID: PREPARATION AND EVALUATION OF PARACETAMOL TABLETS WITH DIFFERENT BINDERS

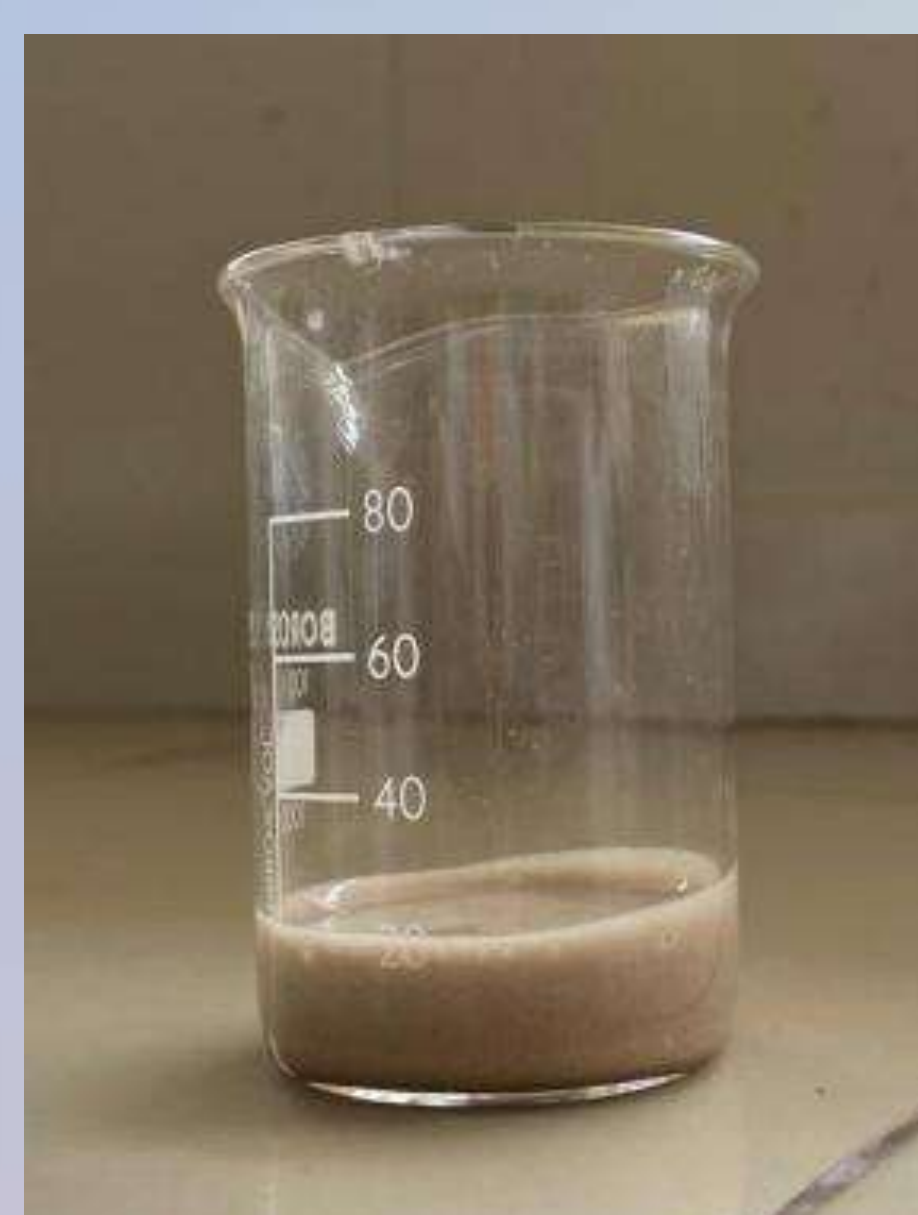
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INTRODUCTION

A tablet is a pharmaceutical oral dosage form or solid unit dosage form that comprises either medicament or medicaments with suitable excipients. It comprises a mixture of active pharmaceutical ingredients and excipients, usually in powder form, pressed or compacted into a solid dose. The excipients can include diluents, binders, glidants and lubricants to ensure tableting, disintegration, enhance taste and aid in visual identification of an unknown tablet. A tablet can be formulated to convey a precise dose to a specific site; it is usually taken orally, yet can be controlled sublingually, buccally, rectally or intravaginally. Tablets are prepared either by molding or by compression. Tablet manufacturing processes are mainly of three types: Wet granulation, Dry granulation and Direct compression method. Analgesics, additionally called pain relievers, are drugs that free various sorts from torment from migraines to wounds to arthritis. Paracetamol is an effective analgesic, and is useful in a broad range of clinical conditions. The tablets were prepared by wet granulation technique using the binders (starch and acacia) at 10% concentration.

AIM

1. To formulate Paracetamol tablets using starch and acacia as binder.
2. Preparation of Paracetamol granules.
3. Preformulation studies of prepared Paracetamol granules.
4. Formulation of Paracetamol tablet by using wet granulation technique.
5. Evaluation of formulated Paracetamol tablets.



Acacia Paste



Starch Paste

METHOD

- The tablets were prepared using the wet granulation method.
- Paracetamol, starch powder and lactose were weighed and sifted through sieve No.40 thoroughly. The API was mixed with the binders. Prepared Starch and acacia binder paste was used for granulation.
- This mass of powdered material and binder was sifted through sieve no. 12, to obtain granules. The wet granules were dried in a hot air oven at 60°C.
- Weight of the dried granules was recorded were made to pass through sieve No.16 placed over sieve No. 44 to obtain uniform sized granules.
- The dried granules were mixed with the remaining of the starch powder, which was already passed through sieve No. 40.
- The mixture was then lubricated for 5 min with talc and magnesium stearate which was already passed through sieve No. 60. The lubricated granules were compressed into tablets in a compression machine called Rimek Mini Press -1 to get a tablet of 600 mg weight.
- The die was lubricated with talc prior to the compression to prevent the granules from sticking to the die. 0.6 g of granules were weighed and introduced into the die of 9 mm diameter and compressed to get a tablet of uniform size.
- 10% w/w of starch and acacia paste were prepared by dissolving 10 g of starch and acacia powder in 100 g of water respectively.
- Preformulation tests performed on the Paracetamol granules are:
Angle of Repose, Bulk Density, Tapped Density, Hausner's Ratio, Carr's Index.
- Evaluation tests performed on the Paracetamol tablets are:
Appearance, Hardness, Thickness, Diameter, Weight variation, Friability, Disintegration.

RESULTS

Table 1: Preformulation study results of granules

Tests	Granules made with starch binder	Granules made with acacia binder
Angle of Repose	25°	27.33°
Bulk Density	0.4 g/cc	0.5g/cc
Tapped Density	0.61 g/cc	0.6g/cc
Hausner's Ratio	1.53	1.2
Carr's Index	0.34%	0.16%

Graph 1: in vitro drug release study

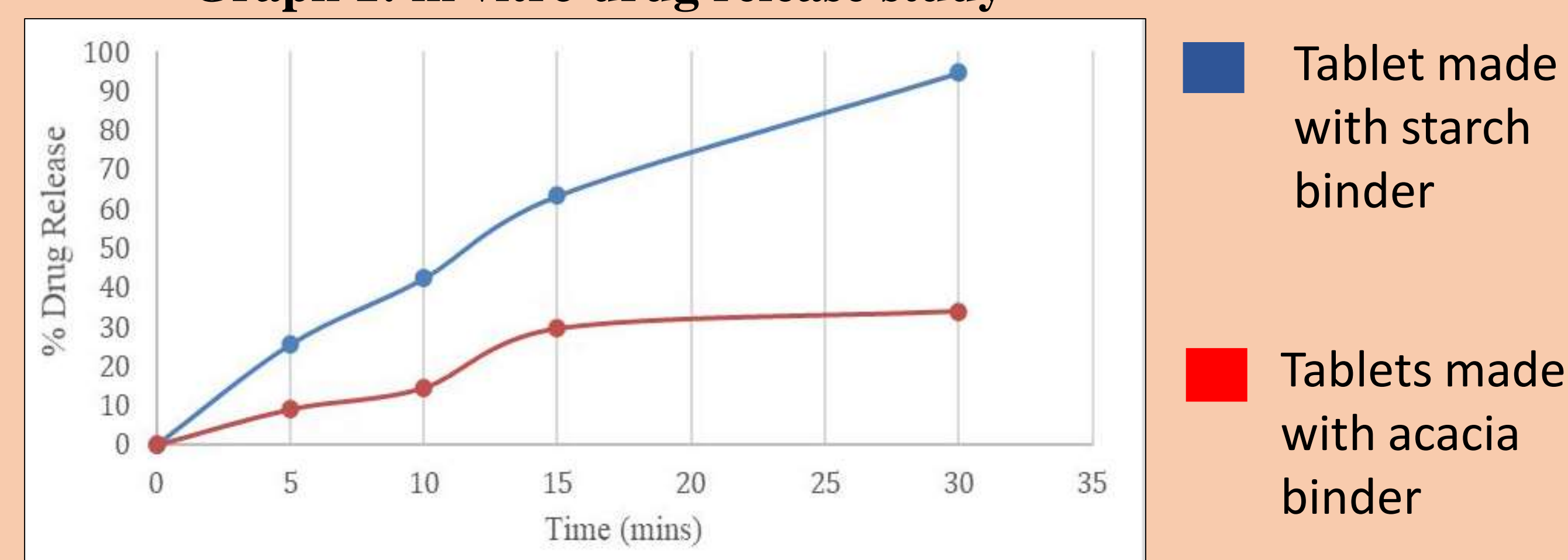


Table 2: Evaluation tests results of Paracetamol Tablets

Evaluation Tests	Tablets made with starch binder	Tablets made with acacia binder
Shape	Round	Round
Hardness	2.5 $\mu\text{g}/\text{cm}^2$	4 $\mu\text{g}/\text{cm}^2$
Thickness	0.418 mm	0.419mm
Diameter	1.257 cm	1.241 cm
Weight variation	Pass	Pass
Friability	10.34%	5%
Disintegration	33 sec	2 min 10 sec

REFERENCES

1. Dash, A., Singh, S. and Tolman, J. (2014). *Pharmaceutics: Basic Principles and Application to Pharmacy Practice*. USA: Elsevier
2. Tovey, G. (2018). *Pharmaceutical Formulation: The Science and Technology of Dosage Forms*. Royal Society of Chemistry
3. Lachman, Lieberman, H.A. and Kanig, J.L., *The Theory and Practice of Industrial Pharmacy*, Lea and Febiger, Philadelphia, 3rd edn., 1986.
4. *Pharmaceutical dosage form : Tablet*, volume 2, Liberman H.A, Lachman L, and Schwartz B.J, Marcel Dekker Publisher ;1989.
5. Summers MP . *Granulation* . In : Aulton ME , editor . *Pharmaceutics :The science of dosage form design* .2nd ed. U.K .Longman grp. Ltd ; 2002

CONCLUSION

The tablets were successfully formulated and evaluated. The prepared Paracetamol granules were evaluated for angle of repose, bulk density, tapped density, Hausner's ratio and Carr's ratio and the results of the parameters of tablets with starch binder was found to be better in Angle of repose, whereas tablets with acacia binder showed good flowability and was superior in Hausner's ratio, Carr's index. The results of all the tests were found to be within the limits. In the evaluation tests, tablets with starch binder passed in disintegration, dissolution, weight variation, thickness and diameter, friability and hardness tests whereas tablets with acacia binder passed weight variation, thickness and diameter, friability and hardness tests but did not pass disintegration and dissolution tests. In vitro dissolution studies, around 94.62% of the drug was released within 30 minutes for tablets with starch binder while only 33.98% of the drug was released within 30 minutes for tablets with acacia binder. Hence, according to our study, starch paste is a better binder than acacia paste in the preparation of paracetamol tablets.

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