EFFECT OF VARIOUS BINDING AGENT AND TABLETING TECHNIQUE ON PHYSICAL PROPERTIES OF STEVIA EFFERVESCENT TABLETS

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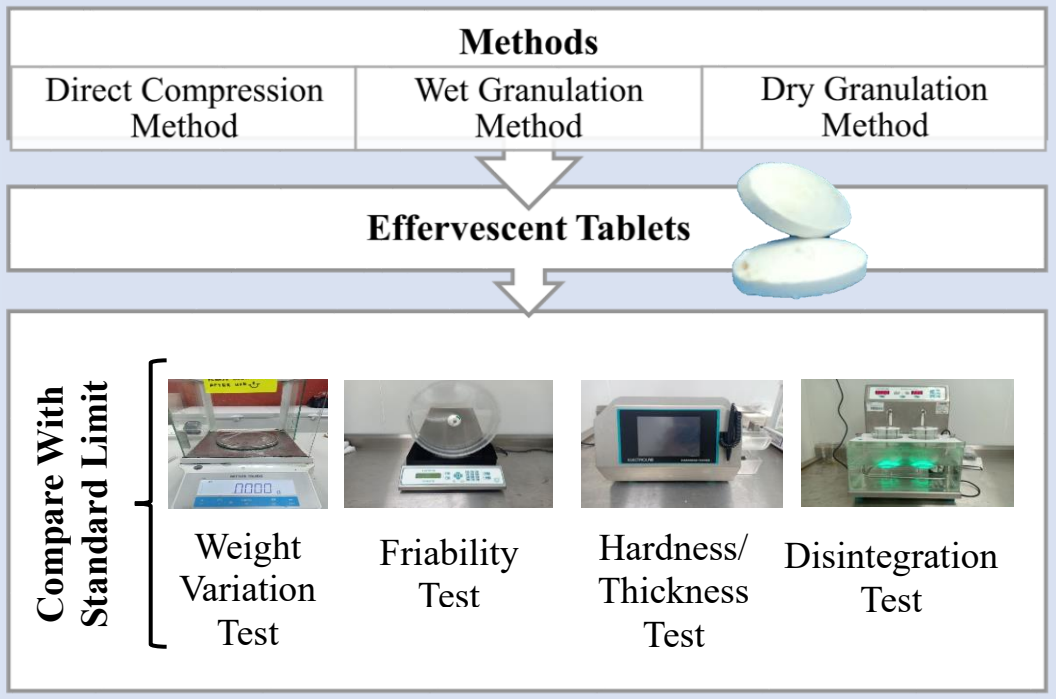
PRODUCT BACKGROUND

- An effervescent tablet based on stevia was formulated. Stevia has a low-calorie sweetener with antioxidant and antidiabetic properties.
- Three methods to prepare the stevia effervescent tablet, which are direct compression method, wet granulation method and dry granulation method.
- The effervescent tablet includes stevia, acidifying agent, alkalizing agent, and binding agent.
- Objectives:
  - To evaluate the effects of binding agent on the physical properties of stevia effervescent tablets prepared by the direct compression method using three different binding agent, namely, xylitol, sorbitol and mannitol.
  - To evaluate the effect of tableting techniques include direct compression method, dry granulation and wet granulation method toward the physical properties of the stevia effervescent tablets.

METHODS



NOVELTY/ ORIGINALITY/ INVENTIVENESS

- Stevia sweetener products in the market are often in liquid, powder and other solid dosage forms.
- No effervescent tablet dosage formulated based on Stevia in the market.
- This effervescent tablet dosage form can help to solve the overdose and swallow difficulty problems.

USEFULNESS

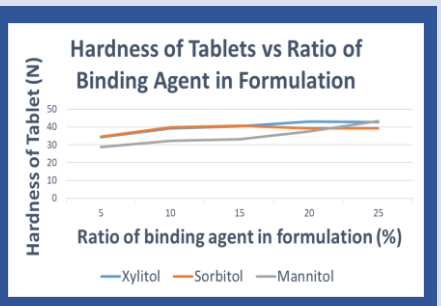
- Active Pharmaceutical Ingredient (API) – Stevia
  - Chemical Properties
  - Biological Properties
  - Medicinal Health Benefits
- Effervescent Tablets - act as an alternative dosage form to overcome the limitation level of stability of the APIs when in liquid form.

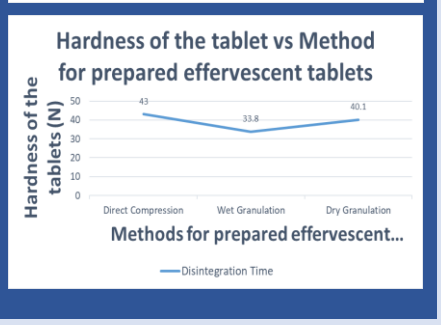
STATUS OF INNOVATION

- Prototype

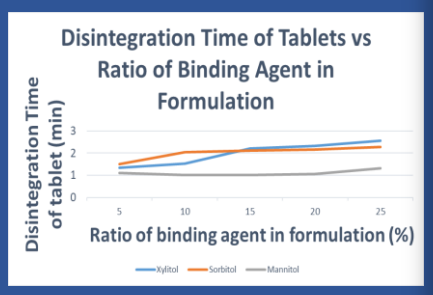
RESULTS

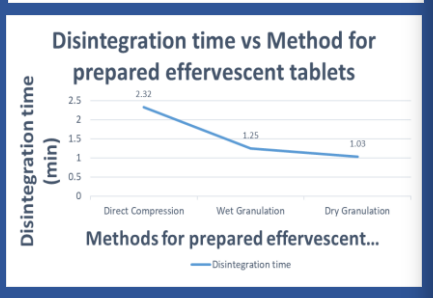
Hardness test





Disintegration test





Weight variation, Friability, Thickness test

THICKNESS TEST

F	Xylitol (mm ± SD)	Sorbitol (mm ± SD)	Mannitol (mm ± SD)
F1	3.955 ± 0.0614	4.089 ± 0.0597	3.739 ± 0.0205
F2	3.946 ± 0.0095	4.098 ± 0.0825	4.003 ± 0.0204
F3	3.917 ± 0.0548	4.034 ± 0.0220	3.959 ± 0.0293
F4	3.967 ± 0.0245	4.106 ± 0.0422	3.953 ± 0.0310
F5	4.040 ± 0.0220	3.938 ± 0.0619	3.657 ± 0.0188

FRIABILITY TEST

F	Xylitol (g ± SD)	Sorbitol (g ± SD)	Mannitol (g ± SD)
F1	0.049 ± 0.0305	0.050 ±0.0464	0.036 ± 0.0196
F2	0.027 ± 0.0120	0.079 ± 0.1027	0.079 ± 0.0973
F3	0.017 ± 0.0151	0.038 ± 0.0237	0.218 ± 0.2629
F4	0.011 ± 0.0040	0.042 ± 0.0014	0.024 ± 0.0187
F5	0.010 ± 0.0012	0.058 ± 0.0634	0.168 ± 0.1181

WEIGHT VARIATION TEST

F	Xylitol (mg ± SD)	Sorbitol (mg ± SD)	Mannitol (mg ± SD)
F1	288.6 ± 0.0020	288.7 ± 0.0029	280.6 ± 0.0005
F2	292.8 ± 0.0012	297.0 ± 0.0015	287.2 ± 0.0011
F3	286.5 ± 0.0012	292.0 ± 0.0047	290.7 ± 0.0026
F4	290.1 ± 0.0030	292.6 ± 0.0011	290.9 ± 0.0023
F5	296.1 ± 0.0039	283.7 ± 0.0049	302.9 ± 0.0008

The comparison of the tableting technique and the Formulation 4 of Xylitol

Testing	Direct Compression	Wet granulation	Dry granulation
Friability (%)	0.02	0.08	0.04
Hardness (N)	43.027	33.8	40.1
Disintegration time (min s)	2.32	0.85	1.03
Weight variation (g)	0.2901	0.2783	0.2957
Thickness (mm)	3.967	3.788	4.087

PUBLICATION

- Mohamad, F. I., Goh, Y. L., Haironlizan, S. A., & Mohd Shahrir, N. A. (2021). Effect of various binding agent and tableting technique on physical properties of stevia effervescent tablets.

MARKETABILITY & COMMERCIALISATION

- ↑ probability of market launch.
- There is no effervescent tablet formulated based on Stevia in market.
- Stevia effervescent tablet is great approach to consume in discreet and controlled quantities and disintegrates quickly compared with liquid and powder form.

ENVIRONMENTAL IMPACT

- Three types of binder were used which were sugar alcohols binder.
- These binders were green materials which mean its don't have adverse effect toward the body.

COST ANALYSIS

	Stevia Effervescent Tablets	Other marketed product
Price	RM 20	RM 22.50