

# Formulation and Evaluation Lozenges of *Graptophyllum pictum*.L Leaves Ethanol Extract

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## Abstract

Lozenges are one of the solid dosage forms, have a bright future as a novel method of delivering drugs for local action and systemic effect in the oral cavity. The lozenges are solid medicated, flavored and sweetened base. This study aimed to develop formulation and evaluation of *Graptophyllum pictum*. L leaves as lozenges by using gelatin as a base. The leaves used were extracted in ethanol (70%) and then the phytochemical screening was carried out. Lozenges were made in various concentrations of gelatin (15%, 16,5%, 18%, 19,5%, 21%) by the molded method. The physical evaluation includes hardness, cohesiveness, and elasticity tests which were compared with samples of lozenges on the market. The results showed that lozenges met the standard criteria and provided information that gelatin can be used as a base material that provides good physical properties of the preparation. The use of 18% gelatin resulted in hardness and cohesiveness which were not significantly different from the comparison product.

**Keywords:** Gelatin, *Graptophyllum pictum*.L, Lozenges

# Formulation and Evaluation Lozenges of *Graptophyllum pictum*.L Leaves Ethanol Extract

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## Introduction

Lozenges are one of the solid dosage forms, have a bright future as a novel method of delivering drugs for local action and systemic effect in the oral cavity. Wungu leaves (*Graptophyllum pictum* L.) are efficacious as antibacterial to overcome dental caries.

The use of wungu leaf ethanol extract (WLEE) for the treatment of dental caries was developed in a dosage form so easy to use and make comfortable. The dosage forms have been chosen is in the form of soft lozenges because it is more practical durable in the mouth, attractive, and cover the bitter taste of wungu leaves.

## Objectives

This study aimed to develop formulation and evaluation of *Graptophyllum pictum*. L leaves as lozenges by using gelatin as a base. The leaves used were extracted in ethanol (70%) and then the phytochemical screening was carried out.

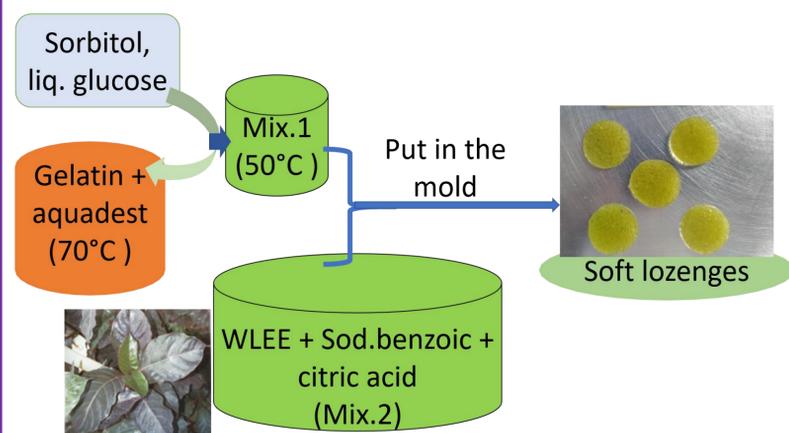
## Material and Methods

### Materials

Wungu leaves (*Graptophyllum pictum*. L) ethanol extract 70%, gelatine type B (Nitta Gelatin Lmt.), sorbitol (Dwilab), liq.glucose (Cargill), citric acid (Brataco), oil peppermint (Harum Kimia), and aquadest.

### Methods

Lozenges were made in various concentrations of gelatin (15%, 16.5%, 18%, 19.5%, 21%) by the molded method. Variation of gelatin concentration based on ability and characteristics gelatin as a base, which can form elasticity of lozenges. The physical evaluation includes organoleptics, weight uniformity, hardness, cohesiveness, and elasticity tests which were compared with samples of lozenges on the market.



Pic.1 Scheme of WLEE soft lozenges preparation

## Results

Component of soft lozenges formulation can be seen by the following Table 1 (for 1.5 g weight of each lozenges).

Table 1. Soft Lozenges Formula

Formula	Concentration of component (% w/w)							
	WLEE*	Gelatin	Sorbitol	Liq. glucose	Citric acid	Sodium benzoate	Peppermint Oil	Aquadest (ad)
F1	5	15.0	25	25	0.5	0.1	qs	100
F2	5	16.5	25	25	0.5	0.1	qs	100
F3	5	18.0	25	25	0.5	0.1	qs	100
F4	5	19.5	25	25	0.5	0.1	qs	100
F5	5	21.0	25	25	0.5	0.1	qs	100

\*) WLEE = Wungu Leaves Ethanol 70% Extract

The results showed that all lozenges met the required standard criteria, have a chewy shape and a sweet taste. The test results are as shown in the table 2.

Table 2. Soft Lozenges Physical Evaluation

Formula	Average weight (gram)	Average diameter (cm)	Average thickness (mm)	Hardness (gf)	Elasticity (%)	Cohesion
F1	1.54 ±0.03	2.39 ±0.02	2.62 ±0.08	41.7 <sup>a</sup> ± 0.5	100 ± 0	0.944 <sup>a</sup> ± 0.006
F2	1.53 ±0.02	2.40 ±0.03	3.15 ±0.02	45.5 <sup>b</sup> ± 0.9	100 ± 0	0.957 <sup>b</sup> ± 0.004
F3	1.50 ±0.03	2.43 ±0.02	3.22 ±0.02	48.9 <sup>c</sup> ± 1.2	100 ± 0	0.972 <sup>c</sup> ± 0.004
F4	1.51 ±0.02	2.43 ±0.05	3.16 ±0.04	58.4 <sup>d</sup> ± 0.7	100 ± 0	0.977 <sup>c</sup> ± 0.002
F5	1.54 ±0.02	2.45 ±0.03	3.14 ±0.04	66.5 <sup>e</sup> ± 1.0	100 ± 0	0.989 <sup>d</sup> ± 0.002
Market Product	N/A	N/A	N/A	50,17 <sup>c</sup> ± 1,3	100 ± 0	0,968 <sup>c</sup> ± 0,005

The comparison product that used gave no significant difference in terms of elasticity. This result gives information that gelatin can be used as a base material that provides good physical properties of the preparation.

## Conclusion

The use of **18% gelatin** resulted in hardness and cohesiveness which were not significantly different from the comparison product

## References

- Schrieber, R., Gareis, H. (2013). *Gelatin Handbook Theory and Industrial Practice*. WILEY-VCH Verlag GmbH & Co. KGaA.
- Umashankar. (2016). Chewable Lozenge Formulation- a Review. *International Research Journal of Pharmacy*, 7(4), 9–16.
- Choursiya, S., Andheriya, D. Review on Lozenges (2018). *Journal of Drug Delivery & Therapeutics*. 2018; 8(6-A):124-128
- Lely, N., Triwidodo, J., & Sari, E. R. (2017). Uji Aktivitas Antimikroba Ekstrak Daun Wungu (*Graptophyllum pictum* L. Griff) Dengan Metode Bioautografi. *Jurnal Ilmiah Bakti Farmasi*, 2(1), 49–56.

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