

**THESIS**

**INNOVATION OF NANOSPRAY KERSEN LEAF EXTRACT  
(*Muntingia calabura* L) AS A TREATMENT FOR DIABETIC  
WOUNDS INDUCED BY *Staphylococcus aureus***



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## ABSTRACT

Injuries experienced by people with diabetic mellitus, if not treated appropriately, can cause amputation and even risk death. Treatment of diabetic wounds can utilize natural ingredients, one of which is kersen leaves because they have anti-inflammatory and antibacterial properties. Nanospray preparations were chosen because they have a very small size so that they can increase drug absorption and the therapeutic effect to be more optimal. The purpose of this study is to determine the characteristics of the nanospray formulation of kersen leaf extract and to determine the effectiveness of nanospray on diabetic wounds in experimental animals. This research method is experimental *laboratories* by conducting a kersen leaf extraction process by maceration method using 96% ethanol solvent in a ratio of 1:5. Nanospray preparations were made in 3 formulas with different concentrations of kersen leaf extract of 25 mg (F1), 50 mg (F2), and 100 mg (F3). The evaluation of the preparation included organoleptic test, pH test, particle size test, polydispersity index test, and effectiveness test on diabetic rat wounds. The effect of differences in extract concentration on pH and wound effectiveness was analyzed using One Way Anova with SPSS 16.0 and a significance level of 95%. The results showed that the nanospray preparation of kersen leaf extract had a greenish-yellow color, a distinctive odor of kersen leaf extract, and a clear–cloudy color. All formulas are homogeneous, pH value 4.7–6.2; F1 and F2 are nano-sized, while F3 is not (>100). The difference in the concentration of kersen leaf extract affected the pH value of the preparation ( $p < 0.05$ ). Nanospray of kersen leaf extract F2 had the best effect in healing the wounds of *S. aureus*-induced diabetic rats ( $p < 0.05$ ).

**Keywords:** *Muntingia calabura*, diabetic wound, formulation, nanospray, *Staphylococcus aureus*

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## LIST OF CONTENTS

	Page
APPROVAL SHEET .....	i
VALIDITY SHEET .....	ii
ABSTRACT .....	iii
FOREWORD .....	iv
LIST OF CONTENTS .....	vi
LIST OF TABLES .....	viii
LIST OF PICTURES .....	ix
STATEMENT OF RESEARCH AUTHENTICITY .....	x
CHAPTER I INTRODUCTION .....	1
1.1 Background.....	1
1.2 Formulation of the problem.....	3
1.3 Research purposes .....	3
1.4 Benefits of research .....	3
1.5 Authenticity of Research .....	4
CHAPTER II LITERATURE REVIEW.....	6
2.1 Theoretical basis .....	6
2.1.1 Diabetic mellitus.....	6
2.1.2 Diabetic Wounds .....	7
2.1.3 Kersen Plant.....	9
2.1.4 Extraction.....	11
2.1.5 Bacteria <i>Staphylococcus aureus</i> .....	14
2.1.6 Nanospray Preparation.....	16
2.2 Halal Product Analysis .....	21
2.3 Theoretical Framework.....	23
2.4 Conceptual Framework.....	24
2.5 Hypothesis .....	24
CHAPTER III RESEARCH METHODS .....	25
3.1 Types and Design of Research .....	25
3.2 Time and Place of Implementation.....	26

3.3	Population and Sample .....	26
3.4	Research Variables .....	26
3.5	Operational Definition of Variables .....	26
3.6	Research Materials and Tools .....	27
3.7	<i>Ethical Clearance</i> .....	28
3.8	Research Procedures.....	28
3.9	Data analysis.....	32
3.10	Halal Product Analysis .....	32
3.11	Research Flow Chart .....	33
3.12	Research Schedule .....	33
CHAPTER IV RESULTS AND DISCUSSION.....		35
4.1	Phytochemical Screening of Kersen Leaf Extract.....	35
4.2	Nanospray Evaluation Test of Kersen Leaf Extract .....	36
4.3	In Vivo Test of Nanospray Preparation Effectiveness .....	43
4.4	Halal Analysis of Nanospray Products of Kersen Leaf Extract .....	47
CHAPTER V CONCLUSION AND SUGGESTIONS.....		50
5.1	Conclusion.....	50
5.2	Suggestion .....	50
BIBLIOGRAPHY .....		51
APPENDIX.....		65
Appendix 1 <i>Certifikat Of Strains Wistar</i> .....		65
Appendix 2 <i>Ethical Clearance</i> .....		66
Appendix 3 Plant Determination.....		67
Appendix 4 Nanospray Measurement Results Using PSA F1 .....		68
Appendix 5 Nanospray Measurement Results Using PSA F2.....		69
Appendix 6 Nanospray Measurement Results Using PSA F3.....		70
Appendix 7 Formulation Evaluation Data .....		73
Appendix 8 Data Analysis Results.....		74
Appendix 9 Activity Documentation .....		76



## LIST OF TABLES

	Page
Table 1 Authenticity of Research.....	4
Table 2 Nanospray Formulation of Kersen Leaf Extract.....	25
Table 3 Operational Definition .....	27
Table 4 Research Schedule .....	33
Table 5 Phytochemical Screening Results of Kersen Leaf Extract.....	35
Table 6 Organoleptic Test Results of Nanospray Kersen Leaf Extract .....	37
Table 7 Average Results of Homogeneity Test .....	39
Table 8. Average Results of pH Test .....	39
Table 9. Average Results of Particle Size Test and Polydispersity Index .....	40
Table 10 Wound Healing Duration Observation Results.....	43
Table 11 Halal Analysis .....	48

## LIST OF PICTURES

	Page
Picture 1 Kersen Leaves.....	10
Picture 2 Percolator Tool .....	12
Picture 3 Reflux Device .....	13
Picture 4 Bacteria S. Aureus .....	15
Picture 5 Nanoemulsion Structure .....	17
Picture 6 Polyethylene Glycol Structure.....	18
Picture 7 Tween 80 Structure.....	19
Picture 8 Aquadest Structure.....	20
Picture 9 Ways of working Particle Size Analyzer.....	20
Picture 10 Theoretical Framework.....	23
Picture 11 Conceptual Framework.....	24
Picture 12 Research Flow Chart.....	33
Picture 13 Results of F1, F2 and F3 preparations .....	37
Picture 14 Average pH Test Graph .....	40
Picture 15 Average Particle Size Graph of Nanospray .....	41
Picture 16 Average Polydispersity Index Graph.....	42
Picture17. Average Wound Healing Duration Graph .....	44

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I sincerely declare that the research compiled in this thesis is originally my own work and does not belong to anyone else. This thesis has never been published before, except for a few parts with original references

If in the future it is found that this work is plagiarism, I am ready to be given administrative and academica sanction.

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