

THESIS

**THE EFFECT OF POMEGRANATE (*Punica granatum*
L.) EXTRACT STANDARDIZED WITH 40% OF
ELLAGIC ACID AS TOPICAL OINTMENT
TOWARDS TOTAL AND DIFFERENTIAL
COUNT OF LEUKOCYTES ON BURN
INJURY IN ALBINO RATS
(*Rattus norvegicus*)**



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DECLARATION

Hereby, I declare that in this thesis entitled:

**THE EFFECT OF POMEGRANATE (*Punica granatum L.*) EXTRACT
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there is no other work ever published to obtain a college degree in a certain college and to my knowledge there is also no work or option ever written or published by others, except those in writing referred to this paper and mentioned in the references.

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SUMMARY

Rana Salsabila Salam, this research aims to analyze the total and differential count of leukocytes in albino rats which conducted with second degree burn injury and treated with pomegranate extract that standardized with 40% of ellagic acid.

Burn injury is caused by thermal heat that damaged tissue. The healing process of burn injury known to be more complicated than other injuries. In the healing process leukocytes are needed to be used in hemostasis, inflammation, proliferation and remodeling phase. Those are the phase of healing process. Alteration of this phase may lead to delay or inability to heal completely.

A pomegranate juice from the whole fruits known to be the rich source of polyphenol antioxidant, which are an ellagitannin known as punicalagin a chemical compound or molecule, it is broken up into ellagic acid and released into the bloodstream over several hours. Current research mostly showed ellagic acid ellagitannins as the most beneficial constituent of pomegranate. Standardized pomegranate extract with 40% of ellagic acid is believed to increase the therapeutic effect.

This research use 40 albino rats that divided into 10 treatment groups. The treatment consists of treated with ointment base (P0), burnazin (P1), 2.5% of SPE (P2), 5% of SPE (P3), and 10% of SPE (P4). One group from each treatment sacrificed on the 8th days and the rest group of each treatment were sacrificed on the 15th days. Treatments were given topically, two times a day started after the burn injury construction. The treatment was completed for 7 and 14 days, blood

samples were taken (intracardiac) and deposited into EDTA tubes, then taken to the laboratory to examine the total and differential count of leukocytes using Hematology Analyzer Sysmex XT-2000i. The result analyzed using ANOVA and Duncan test.

The result showed no significant difference among P0, P1, P2, P3 and P4 in leukocytes, eosinophils, basophils, and monocytes count ($p>0.05$) meanwhile there were significant difference in neutrophils and lymphocytes count ($p<0.05$). The 10% of SPE ointment have the best result among all the treatment.

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ABSTRACT

The aim of this research to investigate the effect of pomegranate extract (*Punica granatum L.*) standardized with 40% of ellagic acid (SPE) as topical ointment towards total and differential count of leukocytes on second degree burn injury in the gluteal parts of albino rats (*Rattus norvegicus*). Fourty male rats, at three months of age, and 150 gram in body weight were used as experimental animal. The animals were divided into 10 treatment groups. The treatment consists of treated with ointment base (P0), burnazin (P1), 2.5% of SPE (P2), 5% of SPE (P3), and 10% of SPE (P4). One group from each treatment sacrificed on the 8th days and the rest group of each treatment were sacrificed on the 15th days. Treatments were given topically, two times a day started after the burn injury construction. The treatment was completed for 7 and 14 days, blood samples were taken (intracardiac) and deposited into EDTA tubes, and taken to the laboratory to examine the total and differential count of leukocytes using Hematology Analyzer Sysmex XT-2000i. This study was analyzed with ANOVA and Duncan test. The result showed no significant difference among P0, P1, P2, P3 and P4 in leukocytes, eosinophils, basophils, and monocytes count ($p > 0.05$) meanwhile there were significant difference in neutrophils and lymphocytes count ($p < 0.05$). The 10% of SPE ointment have the best result among all the treatment.

Keywords: *Burn injury, pomegranate extract standardized with ellagic acid, total and differential count of leukocytes*

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This research result is clearly still needs further development and correction. Any suggestion and correction that will help in the improvement of this thesis are highly expected. The author wishes that this research will be useful for the advancement of science and may give a contribution to the Veterinary Medicine field and all the people who needs it.

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Author

CONTENTS

	Page
ENDORSEMENT FORM.....	ii
DECLARATION.....	iii
IDENTITY	iv
SUMMARY	vi
ABSTRACT	viii
ACKNOWLEDGEMENT	ix
CONTENTS	xii
LIST OF TABLES.....	xiv
LIST OF FIGURES	xv
LIST OF APPENDIX	xvi
ABBREVIATIONS AND SYMBOLS.....	xvii
 CHAPTER 1 INTRODUCTION.....	 1
1.1. Research Background	1
1.2. Problem Statement.....	3
1.3. Theoretical Base.....	3
1.4. Research Aims.....	5
1.5. Research Outcome.....	5
1.6. Hypothesis.....	5
 CHAPTER 2 LITERATURE REVIEW	 6
2.1. Pomegranate (<i>Punica granatum L.</i>)	6
2.1.1. The content of <i>Punica granatum L.</i>	7
2.1.2. The activity of <i>Punica granatum L.</i>	8
2.1.2.1. Anti-inflammation activity of <i>Punica granatum L.</i> ..	8
2.1.2.2. Antioxidant activity of <i>Punica granatum L.</i>	10
2.1.2.3. Antimicrobial activity of <i>Punica granatum L.</i>	10
2.2. Burn Injury	11
2.2.1. Classification of burn injury	12
2.2.2. Pathophysiology of burn injury.....	13
2.2.3. Stages of wound healing	15
2.3. Leukocytes	19
2.2.1. Eosinophils.....	19
2.2.2. Basophils.....	20
2.2.3. Neutrophils.....	21
2.2.4. Lymphocytes	22
2.2.5. Monocytes.....	23
2.4. Topical Ointment.....	24
2.5. Albino Rat (<i>Rattus norvegicus</i>).....	26
2.5.1. Rat hematology value	27
 CHAPTER 3 MATERIALS AND METHOD	 28
3.1. Experimental Design	28

3.2. Research Location and Time.....	28
3.3. Research Materials and Equipment.....	28
3.3.1. Experimental animals	28
3.3.2. Research materials	29
3.3.3. Research equipment.....	29
3.4. Research Method.....	29
3.4.1. Preparation of pomegranate topical ointment	29
3.4.2. Preparation and treatment of experimental animal	30
3.4.3. Samples collection.....	30
3.4.4. Samples examination.....	31
3.5. Research Variables	31
3.6. Operational definition of variables	31
3.7. Data Analysis	33
3.8. Experimental Flowchart.....	34
CHAPTER 4 RESEARCH RESULTS	35
4.1. Total Count of Leukocytes.....	35
4.2. Differential Count of Leukocytes.....	36
4.2.1. Eosinophils.....	36
4.2.2. Basophils	37
4.2.3. Neutrophils.....	39
4.2.4. Lymphocytes	40
4.2.5. Monocytes.....	41
CHAPTER 5 DISCUSSION	43
5.1. Total Count of Leukocytes.....	43
5.2. Differential Count of Leukocytes.....	44
5.2.1. Eosinophils.....	44
5.2.2. Basophils	45
5.2.3. Neutrophils.....	46
5.2.4. Lymphocytes	47
5.2.5. Monocytes.....	48
CHAPTER 6 CONCLUSION AND SUGGESTION.....	50
6.1. Conclusion	50
6.2. Suggestion.....	50
REFERENCES	51
APPENDIX.....	55

LIST OF TABLES

Table	Page
2.1 Rat hematology value.....	27
4.1. The total count of leukocytes in 8 and 15 days	35
4.2. The eosinophils count in 8 and 15 days	37
4.3. The basophils count in 8 and 15 days	38
4.4. The neutrophils count in 8 and 15 days.....	39
4.5. The lymphocytes count in 8 and 15 days	41
4.6. The monocytes count in 8 and 15 days	42

LIST OF FIGURES

Figure	Page
2.1. Pomegranate fruit (Jorgensen and Brennand., 2005).....	6
2.2. Structure of ellagic acid (Jurenka, 2008)	7
2.3. Skin layers (Mescher, 2013).....	12
2.4. Jackson's burns zones theory (Hettiaratchy, 2004)	14
2.5. Eosinophils (Hoffbrand and Moss, 2016., Al-Zubaydi, 2010).....	20
2.6. Basophils (Hoffbrand and Moss, 2016., Al-Zubaydi, 2010).....	21
2.7. Neutrophils (Hoffbrand and Moss, 2016., Al-Zubaydi, 2010).....	22
2.8. Lymphocytes (Hoffbrand and Moss, 2016., Al-Zubaydi, 2010).....	23
2.9. Monocytes (Hoffbrand and Moss, 2016., Al-Zubaydi, 2010).....	23
2.10. Albino rat (Janvier-Labs, 2016)	26
3.1. Experimental flowchart	34
4.1. Total count of leukocytes in 8 and 15 days group.....	36
4.2. Eosinophils count in 8 and 15 days group.....	37
4.3. Basophils count in 8 and 15 days group.....	38
4.4. Neutrophils count in 8 and 15 days group.....	40
4.5. Lymphocytes count in 8 and 15 days group.....	41
4.6. Monocytes count in 8 and 15 days group.....	42

LIST OF APPENDIX

Appendix	Page
1. Treatment in Laboratory Animals.....	55
2. Blood Sample Collection and Examination	57
3. Topical Ointment Dosage Calculation	58
4. Schematic of Burn Tool	59
5. Standardized Pomegranate Extract Certificate	60
6. The Total and Differential Count of Leukocytes on 8 th Days	61
7. The Total and Differential Count of Leukocytes on 15 th Days	62
8. Analysis Result	63
9. Documentation.....	68

ABBREVIATIONS AND SYMBOLS

ADP	=	Adenosine Phosphate
ANOVA	=	Analysis of Variances
CCl ₄	=	Carbon Tetrachloride
COX	=	Cyclooxygenase
CPSO	=	Cold Pressed Pomegranate Seed Oil
EA	=	Ellagic Acid
ECF-A	=	Eosinophilic Chemotactic Factor of Anaphylaxis
EDTA	=	Ethylene Diamine Tetra Acetid Acid
ETs	=	Ellagitannins
FPJ	=	Fermented Pomegranate Juice
MCH	=	Mean Corpuscular Hb
MCHC	=	Mean Corpuscular Hb concentration
MCV	=	Mean Corpuscular volume
MMPs	=	Matrix Metalloproteases
PEG	=	Polyethylene Glycol
PMN	=	Polymorphonuclear
PPE	=	Pomegranate Peel Extract
RBC	=	Red Blood Cell
SPSS	=	Statistic Product Service Solution
SPE	=	Standardized Pomegranate Extract
SSD	=	Silver Sulfadiazine
TIMPs	=	Tissue Inhibitors Metalloproteases
WBC	=	White Blood Cell