CHAPTER 1: GENERAL INTRODUCTION AND LITERATURE REVIEW

CHAPTER 1: GENERAL INTRODUCTION AND LITERATURE REVIEW………1

1.1 REVIEW ON SKIN…………………………………………………………….1

1.1.1 FUNCTIONS OF SKIN………………………………………………….1

1.1.2 ANATOMY AND HISTOLOGY OF SKIN……………………………2

1.1.2.1 EPIDERMIS……………………………………………………………2

1.1.2.2 DERMIS……………………………………………………………4

1.1.2.3 HYPODERMIS…………………………………………………………5

1.2 REVIEW ON WOUNDS AND WOUND HEALING………………………..6

1.2.1 CLASSIFICATION OF WOUNDS……………………………………….6

1.2.2 CATEGORIES OF WOUND HEALING……………………………….7

1.2.3 PRINCIPLES OF WOUND HEALING………………………………..7

1.2.3.1 INFLAMMATORY PHASE………………………………………..8

1.2.3.2 PROLIFERATIVE PHASE…………………………………………11

1.2.3.3 REMODELING PHASE……………………………………………15

1.2.4 PROBLEMS AND FACTORS AFFECTING WOUND HEALING…16

1.3 REVIEWS ON WOUND CARE……………………………………………..18

1.3.1 WOUND DRESSINGS………………………………………………….18

1.3.2 NATURAL PRODUCTS AND WOUND HEALING………………….19
# 1.4 REVIEW ON HONEY IN WOUND DRESSING

- 1.4.1 NOMENCLATURE OF HONEY
- 1.4.2 GENERAL CHARACTERISTICS OF HONEY
- 1.4.3 HONEY AS WOUND DRESSING

# 1.5 RESEARCH OBJECTIVES

## CHAPTER 2: HONEY PURITY TESTS

- 2.1 INTRODUCTION
- 2.2 RESEARCH OBJECTIVES
- 2.3 MATERIALS AND METHODS
  - 2.3.1 MATERIALS
    - 2.3.1.1 HONEY SAMPLES
    - 2.3.1.2 CHEMICALS AND REAGENTS
    - 2.3.1.3 INSTRUMENTS AND APPARATUS
  - 2.3.2 METHODS
    - 2.3.2.1 DETERMINATION OF HYDOXYMETHYLFURFURAL (HMF)
    - 2.3.2.2 DETERMINATION OF SUGAR PROFILE
    - 2.3.2.3 DETERMINATION OF WATER CONTENT IN HONEY
    - 2.3.2.4 DETERMINATION OF HYDROGEN PEROXIDE
    - 2.3.2.5 DETERMINATION OF pH LEVEL
- 2.4 RESULTS AND DISCUSSIONS
  - 2.4.1 HMF LEVEL IN HONEY SAMPLES
  - 2.4.2 SUGAR PROFILE IN HONEY
  - 2.4.3 WATER CONTENT IN HONEY
  - 2.4.4 pH LEVEL IN HONEY
  - 2.4.5 HYDROGEN PEROXIDE IN HONEY
- 2.5 CONCLUSION
CHAPTER 3: MACROSCOPIC EVALUATION OF WOUND HEALING

3.1 INTRODUCTION

3.1.1 WOUND MODELS

3.1.2 PARAMETERS OF MACROSCOPIC EVALUATION

3.1.3 EFFECTS OF HONEY ON ANIMAL MODELS

3.2 RESEARCH OBJECTIVES

3.3 MATERIALS AND METHODS

3.3.1 MATERIALS

3.3.1.1 EXPERIMENTAL ANIMAL

3.3.1.2 WOUND DRESSING

3.3.1.3 CHEMICALS AND REAGENTS

3.3.1.4 INSTRUMENTS AND APPARATUS

3.3.2 METHODS

3.3.2.1 ETHICS

3.3.2.2 EXPERIMENTAL WOUND MODEL

3.3.2.3 WOUNDING PROCEDURES

3.3.2.4 GROUPING AND MODE OF TREATMENTS

3.3.2.5 SAMPLING

3.3.2.6 ASSESSMENT AND MACROSCOPIC EVALUATION OF WOUND HEALING

3.3.3 STATISTICAL ANALYSIS

3.4 EXPERIMENTAL RESULTS

3.4.1 BODY WEIGHTS

3.4.2 DURATION OF WOUND HEALING

3.4.3 GROSS MORPHOLOGY AND MACROSCOPIC OBSERVATION

3.4.4 WOUND SIZE AND HEALED AREA

3.4.5 WOUND CONTRACTION

3.4.6 WOUND APPEARANCE

3.5 DISCUSSIONS

3.6 CONCLUSION
CHAPTER 4: MICROSCOPIC EVALUATION OF WOUND HEALING

4.1 INTRODUCTION

4.1.1 ACUTE WOUND HEALING

4.1.2 HISTOLOGICAL ASSESSMENT OF WOUND HEALING

4.2 OBJECTIVES

4.3 MATERIALS AND METHODS

4.3.1 MATERIALS

4.3.2 METHODS

4.3.3 STATISTICAL ANALYSIS

4.4 EXPERIMENTAL RESULTS
4.4.1 NUMBER OF MACROPHAGES .................................125
4.4.2 EPITHELIALIZATION ........................................127
4.4.3 ANGIOGENESIS ............................................128
4.4.4 FIBROPLASIA ................................................130
4.4.5 COLLAGEN CONTENT .......................................131
4.4.6 MICROSCOPIC EVALUATION ..............................133
   4.4.6.1 DAY 1 OF TREATMENTS ...............................133
   4.4.6.2 DAY 5 OF TREATMENTS ...............................139
   4.4.6.3 DAY 10 OF TREATMENTS .............................150
   4.4.6.4 DAY 15 OF TREATMENTS .............................161
4.5 DISCUSSIONS ..................................................171
4.6 CONCLUSION.....................................................178

CHAPTER 5 GENERAL DISCUSSIONS
CHAPTER 5 GENERAL DISCUSSIONS ................................179
5.1 DISCUSSIONS ...................................................179
5.2 SUGGESTION FOR FURTHER STUDIES ......................191

CHAPTER 6 CONCLUSIONS
CHAPTER 6 CONCLUSIONS .........................................192
6.1 CONCLUSIONS ..................................................192

REFERENCES .......................................................195
APPENDIX ..........................................................207