

**EFFECT OF GRAPEFRUIT (*Citrus paradisi*) PEEL AND RIND
EXTRACTS AGAINST *Ascaris suis***

THESIS

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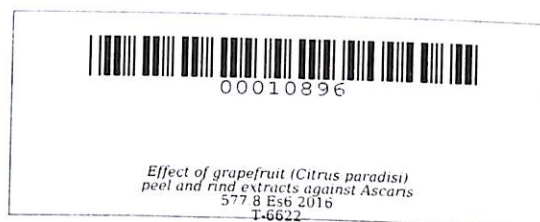
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EXTRACT AGAINST *Ascaris suis***

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ABSTRACT

ESPLANADA, ARIANE LYN B., GLORIANI, JEN-MARIANNE F., TINTE, SIVEL MARIE J. Effects of Grapefruit (*Citrus paradisi*) Peel and Rind Extract Against *Ascaris suis*. Undergraduate Thesis. Bachelor of Science in Medical Technology. College of Nursing, Cavite State University, Indang, Cavite. November 2016. Adviser: Chester Joshua V. Saldaña, DVM, MSc and Flordeliza De Guzman, RMT, MAT.

A study was conducted to determine the effects of Grapefruit (*Citrus paradisi*) against *Ascaris suis*. It also aimed to: determine the phytochemicals present in the peel and rind extract of Grapefruit (*Citrus paradisi*); screen the anthelmintic effect of extracts *in vitro*; and determine the concentration of extract that will exhibit 50 percent and 100 percent mortality on the test organism.

One hundred eleven pieces of Grapefruit (*Citrus paradisi*) were used and extracted by cold pressing. The extracts were subjected to phytochemical screening. The pure (100%) *Citrus paradisi* peel and rind extracts were used and the remaining extracts were diluted at 25, 50 and 75 percent concentration. Anthelmintic assay was performed, the solutions and positive control and negative controls were tested parallel to the treatment groups. Observation was done every 6 to 30 hours. Each treatment was replicated three times. Mortality of the worms at different time intervals was noted analyzed.

Results of the phytochemical screening revealed that *Citrus paradisi* peel and rind possess sterols, triterpenes, alkaloids, saponins, glycosides, flavonoids and tannins. With regards to the anthelmintic activity trials, significantly lower mortality of *Ascaris suis* were recorded by 25 percent *Citrus paradisi* peel and rind extract concentration at

exposure time of 6 hours as compared with 50, 75 and 100 percent concentration. However, when the worms were exposed longer for at least 30 hours, 25 percent peel and rind extract had similar killing effect on *Ascaris suis* as with higher concentrations. The mortality rates of *Ascaris suis* suggested a clear relationship between the concentration and the exposure time. This meant the higher the concentration, the faster it killed all *Ascaris suis*, the longer the time of exposure, the lower the concentration needed to kill all the worms. Thus, the least *Citrus paradisi* peel and rind concentration that could kill all the worms the fastest at 24 hours was 75 percent, while the least peel and rind extract concentration that could kill all the worms at 30 hours or longer is 25 percent. One hundred percent mortality was recorded in all the concentrations at 30 hours post exposure. Lowest mortality rate was observed in distilled water treated *Ascaris suis* while application of albendazole resulted in higher mortality rate at fastest time compared to distilled water and treatment groups.

This study revealed that *Citrus paradisi* peel and rind extract possessed anthelmintic activity against *Ascaris suis*.

TABLE OF CONTENTS

	Page
APPROVAL SHEET	ii
BIOGRAPHICAL DATA.....	iii
ACKNOWLEDGEMENT.....	v
ABSTRACT.....	vii
LIST OF TABLES	xi
LIST OF FIGURES.....	xii
LIST OF APPENDIX TABLES	xiii
LIST OF APPENDIX FIGURES	xiv
LIST OF APPENDICES	xv
INTRODUCTION	1
Objectives of the Study	3
Significance of the Study.....	4
Time and Place of the Study	5
Scope and Limitation of the Study	5
Conceptual Framework of the Study	6
REVIEW OF RELATED LITERATURE.....	7
METHODOLOGY	23
Research Design	23
Materials and Equipment	23
Collection of Grapefruit	23

Extraction of <i>Citrus paradisi</i>	24
Phytochemical Tests	24
Collection of <i>Ascaris suis</i>	25
Preparation of Test Solutions	26
Assessment of the Effect of the <i>Citrus paradisi</i> Extracts in <i>Ascaris suis</i>	26
Data Analysis.....	26
Disposal of Worms and Wastes.....	27
RESULTS AND DISCUSSION	28
Phytochemical Determination of <i>Citrus paradisi</i>	28
Anthelmintic Effect of <i>Citrus paradisi</i> Peel and Rind Extracts	29
Mortality Rates of <i>Ascaris suis</i> exposed to Peel and Rind <i>Citrus paradisi</i> Extracts.....	32
SUMMARY, CONCLUSIONS AND RECOMMENDATION	36
Summary.....	36
Conclusion.....	37
Recommendations.....	38
REFERENCES	39
APPENDICES	43

LIST OF TABLES

Table	Page
1 Phytochemical test results for <i>Citrus paradisi</i> peel and rind extracts.....	28
2 Mean mortality of <i>Ascaris suis</i> treated with different concentrations of <i>Citrus paradisi</i> peel extracts at specific time intervals	29
3 Mean mortality of <i>Ascaris suis</i> treated with different concentrations of <i>Citrus paradisi</i> rind extracts at specific time intervals	30

LIST OF FIGURES

Figure		Page
1	Conceptual paradigm of the study.....	6
2	Comparison of mortality rates of <i>Ascaris suis</i> exposed to <i>Citrus paradisi</i> peel and rind extracts	34

LIST OF APPENDIX TABLES

Appendix Table	Page
1 Raw data on the mortality of <i>Ascaris suis</i> in <i>Citrus paradisi</i> peel extract at different time exposure	44
2 Raw data on the mortality of <i>Ascaris suis</i> in <i>Citrus paradisi</i> rind extract at different time interval	45
3 Result of Analysis of Variance (ANOVA) on the mortality of <i>Ascaris suis</i> at 6 hour exposure time	45
4 Result of Analysis of Variance (ANOVA) on the mortality of <i>Ascaris suis</i> at 12 hour exposure time	46
5 Result of Analysis of Variance (ANOVA) on the mortality of <i>Ascaris suis</i> at 24 hour exposure time.....	46

LIST OF APPENDIX FIGURES

Appendix Figure	Page
1 Grapefruits (<i>Citrus paradisi</i>) purchased from Divisoria, Manila.....	48
2 Preparation of Grapefruit (<i>Citrus paradisi</i>) peel and rind (A)separated peels and rind, (B)grounded peel and rind	49
3 Extraction of Grapefruit (<i>Citrus paradisi</i>) peel (A)cold pressing, (B)The extract after pressing. Note the yellow color of the peel extract	50
4 Peel extract anthelmintic treatment (A)25% concentration, (B)50% concentration, (C)75% concentration, (D)100% Peel extract concentration.....	51
5 Rind extract anthelmintic treatment (A)25% concentration, (B)50% concentration, (C)75% concentration, (D)100% Rind extract concentration.....	52

LIST OF APPENDICES

Appendix		Page
1	Phytochemical test result for <i>Citrus paradisi</i> constituents.....	54
2	Authentication letter from Museum of Natural History, University of the Philippines Los Baños	55
3	Letter of request for <i>Ascaris suis</i> collection.....	56

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INTRODUCTION

Ascariasis is one of the most common human parasitic infections. Up to 10 percent of the population of the developing world were infected with intestinal worms – a large percentage of which were caused by *Ascaris*. It was recently estimated that ascariasis contributes 1.31 million disability-adjusted life years to the global burden of disease and the infection caused approximately 60, 000 deaths per year, mainly in children. The signs included coughing, sometimes accompanied by coughing up of worms, vomiting, loss of appetite, swelling of the abdomen, anemia and impaired physical growth, particularly in children. In rare cases, intestinal blockage or bowel obstruction and pneumonia in severe cases can be found (Pullan & Brocker, 2013).

Ascaris lumbricoides and *Ascaris suis* are widespread parasitic nematodes of humans and pigs respectively. Because adult *Ascaris lumbricoides* and *Ascaris suis*