



***THE APPLICATION OF FLOCOUMAFEN AS THE SECOND GENERATION  
ANTICOAGULANT RODENTICIDE (SGAR) ON NORWAY RAT (RATTUS  
NORVEGICUS) IN SERDANG, SELANGOR***

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**FP 2018 30**

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2017/2018

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NORWAY RAT (*RATTUS NORVEGICUS*) IN SERDANG, SELANGOR

By

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A Project Report Submitted in Partial Fulfilment of the Requirement for the  
Degree of Bachelor of Agriculture Science in the Faculty of Agriculture  
Universiti Putra Malaysia

2018

## DEDICATION

My parents

Mr. Said bin Bohari and Mrs. Rosini binti Alias

My family and relatives

Hasnul Ikhwan, Mohamad Faiz, Amirul Adli, Afifah Nadiah, Muhammad Aqwa

Naim, also my sister-in-law; Nabilah Abd Rahman and Masitah Mohd Zin

My best friends

Izyan Syuhada Ishak, Faizulnizam Malim Sharifmalim and Nor Aisyah Ahmad

And

My supervisor

Assoc. Prof. Dr. Hafidzi Mohd Noor

## ABSTRACT

The application of Flocoumafen as Second Generation Anticoagulant Rodenticide on Norway rat (*Rattus norvegicus*) at Serdang, Selangor

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Few species of rodent in Malaysia known as *Rattus rattus*, *Rattus norvegicus* and also *Rattus argentiventer*. This study required to focus more on *Rattus norvegicus*. *Rattus norvegicus* is a brown rat, known as a street rat, Norway rat or sewer rat. There are a lot of places that suitable for a rodent to grow their population such as landfill area and dining area. The problem is there is a lot of landfill area in Malaysia. This study is about the efficacy of second-generation rodenticide, Flocoumafen on *Rattus norvegicus* in Serdang, Selangor.

The trapping and bait station technique has been used in this study. Three location of the study had been choose in Serdang. The pre-baiting and post baiting observation is to calculate the population of the rat after the post baiting. Nine bait station has been used to put in the flocoumafen. In this study, we would like to identify the commensal rodent species exists in Sri Serdang, Selangor. Secondly, to evaluate the trapping success of *Rattus norvegicus* before and after flocoumafen baiting. Lastly, to estimate the population abundant of *Rattus norvegicus* before and after flocoumafen bait application. The findings of this study are, there is a decreasing number of *Rattus norvegicus* after the application of flocoumafen in the study area. The population estimation of *Rattus norvegicus* is reduced from 101 to 75 rat per week after the flocoumafen application and then the capture estimation is decreased from 10.67% to 5.67% maybe because of bait shyness. So, we can use the flocoumafen as the second generation anticoagulant rodenticide to control *Rattus norvegicus* in Sri Serdang area.

## ABSTRAK

Penggunaan Flocoumafen sebagai Rodentisida Antikoagulan Generasi Kedua (RAGK) pada tikus Norway (*Rattus norvegicus*) di Serdang, Selangor.

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Beberapa spesies tikus di Malaysia yang dikenali sebagai *Rattus rattus*, *Rattus norvegicus* dan juga *Rattus argentiventer*. Kajian ini perlu memberi tumpuan lebih kepada *Rattus norvegicus*. *Rattus norvegicus* adalah tikus coklat yang dikenali sebagai tikus jalanan, tikus Norway atau tikus pembentung. Terdapat banyak tempat yang sesuai untuk tikus membesar dan menambahkan populasinya seperti kawasan pelupusan sampah dan gerai makanan. Masalahnya ialah terdapat banyak kawasan pelupusan sampah di Malaysia. Kajian ini adalah mengenai keberkesanan penggunaan rodentisida generasi kedua, Flocoumafen pada *Rattus norvegicus* di Serdang, Selangor.

Teknik penangkapan dan stesen umpan telah digunakan dalam kajian ini. Tiga lokasi kajian telah dipilih di Serdang. Pemerhatian sebelum penggunaan umpan dan selepas penggunaan umpan adalah untuk mengira populasi tikus selepas penggunaan umpan. Sembilan stesen umpan telah digunakan untuk dimasukkan umpan Flocoumafen. Dalam kajian ini, kami ingin mengenal pasti spesies pemangsa yang terdapat di Sri Serdang, Selangor. Kedua, untuk menilai kejayaan penangkapan *Rattus norvegicus* sebelum dan selepas penggunaan umpan Flocoumafen. Akhir sekali, untuk menganggarkan populasi *Rattus norvegicus* yang banyak sebelum dan selepas penggunaan umpan Flocoumafen. Penemuan kajian ini adalah terdapat penurunan *Rattus norvegicus* selepas penggunaan Flocoumafen di kawasan kajian. Anggaran populasi *Rattus norvegicus* telah dikurangkan dari 101 kepada 75 tikus setiap minggu selepas penggunaan Flocoumafen dan kemudian pengambilan tangkapan berkurangan dari 10.67% hingga 5.67% mungkin disebabkan tikus telah mengenalpasti umpan. Oleh itu, kita boleh menggunakan Flocoumafen sebagai rodentisida antikoagulan generasi kedua untuk mengawal *Rattus norvegicus* di kawasan

Sri

Serdang.

## ACKNOWLEDGMENT

First of all a great thankful to Allah SWT because of His blessing I can finish my final year project titled The Application of Flocoumafen As The Second Generation Anticoagulant Rodenticide (SGAR) on Norway Rat (*Rattus norvegicus*) in Serdang, Selangor successfully.

I also would like to express my thankful feeling to my very supportive and understanding supervisor, Assoc. Prof. Dr. Hafidzi Bin Mohd Noor for his guidance and help while completing my thesis. I learned a lot of new knowledge and hands-on in the field while completing the thesis.

I like to say the greatest appreciation to my family especially to my parent, Said Bin Bohari and Rosini Binti Alias who were very supportive, helpful and understanding. They always give motivational support when things get tough and whenever I feel like everything going down the drain until I finished my final year project.

I would like to thank Miss Maisarah Binti Burhanuddin, Miss Nur Hafizah Binti Che Zaaba and Miss Noor Fitrah Binti Mohd Sidik who provide all the equipment and assistance in the lab and also in the field. Thank you for the knowledge sharing and the memorable experience.

Last but not least, thank you, my friend, Mr. Faizulnizam Malim Bin Sharifmalim who were always there to cherish and give a shoulder support while doing this final year project. Also other of my batchmate who were there during my ups and downs, thank you for your moral support and full of understanding while completing this final year project. Other special thanks to my best friend, Izyan Syuhada Binti Ishak that act as my mentor.

Lastly, I would like to say thank you to the Faculty of Agriculture Science, Universiti Putra Malaysia for providing guidance and good environment for studies while I am here for my Bachelor studies.





## APPROVAL SHEET

I certify that this research project report entitled “The Application of Flocoumafen As The Second Generation Anticoagulant Rodenticide (SGAR) on Norway Rat (*Rattus norvegicus*) at Serdang, Selangor” by Nadhirah Najwa Binti Said has been examined and approved as a partial fulfilment of the requirements for the Degree of Bachelor of Agriculture Science in the Faculty of Agriculture, Universiti Putra Malaysia.

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Date : July 2018

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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

Nowadays, many people around us have complained about the existence of rat around them. They saw rats everywhere such as surrounding their house or at the dining places they usually go during lunch or dinner. Rats occasionally bite people (Pelfrène, 2010). They were afraid if they got bitten by the rats and they noticed that rats capable of transmitting dangerous disease that can lead to death. We know that rodenticides have been widely used to control rodent species such as *Rattus rattus* and *Rattus norvegicus*. The rodent can give damages to crops and also transmit disease either disease directly transmitted by rats or disease indirectly transmitted by rats. Example of disease directly transmitted by rats is Leptospirosis, rat-bite fever and salmonellosis while disease indirectly transmitted by rats are the plague, Colorado tick fever, and cutaneous leishmaniasis.

This study was conducted at Taman Sri Serdang area. There are a lot of houses, dining area, and schools at Sri Serdang. This location is very strategic to conduct this study as there is a lot of delicious yet affordable food for all people in this area to consume meals during their free time. The problem is many of them have seen rats running or roaming during they were having their meals. They said the size of rat is almost the same as the size of a kitten. So at first, they assume that it was a kitten until the rat come cross nearby them. Other cases are there is a scene that a rat came into one of the people trousers' or pants. This scene gives a trauma to that person and also people who see that scene. Thus, it gives the negative impact to that dining area

and people are afraid to have their meals there. The owner of the stalls also experienced huge losses at that time.

There are a few methods that can be used to control the population of the rat. There is a mechanical, chemical or biological method. People usually use the single trap to capture the rats but this method is not very effective. Using single rat trap has a low percentage to control the growing population of the rat. There is increasing evidence that poor bait uptake cause the rat control operations often fail (Inglis et al., 1996). The study has also proved that rat has built resistance to the first generation anticoagulant rodenticide. The rat has developed resistance to the compounds that were used initially (first generation anticoagulant rodenticides—FGARs) (Sánchez-Barbudo et al., 2012) and has led to the introduction of second-generation anticoagulant rodenticide (SGARs) in the 1970s that are more toxic and bioaccumulative (Sánchez-Barbudo et al., 2012). Sri Serdang area is the first study place to test the effectiveness of second-generation anticoagulant rodenticide using flocoumafen to control the rat population.

This study took about four weeks to be completed. The first week, we just do the counting by observation at three different places and also trapping using a single rat trap. Total of 20 single rat trap had been used while conducting this study. The second week, we apply the flocoumafen using bait station. Amount of five blocks of flocoumafen which weigh four gram of each block. A total of 20 gram each bait station has been placed in three different study area which is a dining area, along with the back of the hallway restaurant and lastly at new landfill area. Baiting was applied in a week and we checked if there is any rat consumption towards the second generation rodenticide. If there is consumption, then we added the rodenticide again until the amount of 20 gram in each bait station. An interval of one week is allowed

to reduce bait shyness tendencies. The fourth week, we do the trapping again and the observation. We also observed if there is any rat died in the study area.

## 1.2 Objectives

1. To identify the commensal rodent species exists in Taman Sri Serdang.
2. To evaluate trapping success of *Rattus norvegicus* before and after flocoumafen baiting.
3. To estimate the population abundant of *Rattus norvegicus* before and after flocoumafen bait application.

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## APPENDICES

### **Pre-baiting Observation Incomplete Count for 1 Hour**

Date of Sighting: 26<sup>th</sup> March 2018 (Monday) – Day 1

Time: 10 pm – 12 am

(a) Location 1: Dining Area

Latitude: 3.009314

Longitude: 101.713769

Size area : 10,586.56 m<sup>2</sup>

Distance walked: 322.30 m

Total of rat sighting: 3 Norway rats

(b) Location 2: PKS Restaurant

Latitude : 3.011896

Longitude : 101.717443

Size area : 6,917.90 m<sup>2</sup>

Distance walked: 246.50 m

Total of rat sighting: 2 Norway rats