UNIVERSITI PUTRA MALAYSIA

EFFECT OF HERBAL POWDER, Ferula asafoetida, ON THE CONCEPTION RATE OF RATS

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FPV 2016 57

EFFECT OF HERBAL POWDER, *Ferula asafoetida,* ON THE CONCEPTION RATE OF RATS

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A project paper submitted to the
Faculty of Veterinary Medicine, Universiti Putra Malaysia
In partial fulfilment of the requirement for the
DEGREE OF DOCTOR OF VETERINARY MEDICINE
Universiti Putra Malaysia
Serdang, Selangor Darul Ehsan.

MARCH 2016

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CERTIFICATION

It is hereby certified that I have read this project paper entitled "Effect of Herbal Powder, *Ferula asafoetida*, on the Conception Rate of Rats", by UmikaKanhye and in my opinion it is satisfactory in terms of scope, quality, and presentation as partial fulfilment of the requirement for the course VPD 4999 - Project.

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DEDICATIONS

I dedicate this project to my beloved Mom, Dad and sister who have encouraged and supported me morally through my five year course and my final year project.

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ACKNOWLEDGEMENTS

To the persons that have assisted me throughout this project, I would firstly like to thank my supervisor, Dr Hafandi Bin Ahmad for the guidance, expertise and time that he granted me throughout the duration of my project, and my studies at the faculty. A special thanks also goes to Dr Murugaiyah Marimuthu for giving me such an interesting project title and being by my side to willingly share his knowledge to help. I would also like to thank Dr Farina Mustaffa and animal house UPM staff En. Kamar and En. Noraziman for their patience and help.A special thanks to all my classmate of DVM 2016 who assisted me directly or indirectly in this project with special mention to Santhini Bhaskaran. Lastly, endless gratitude to my family who were always by my side through the ups and downs. They always cheered me up and never gave up on me.

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ABSTRAK

Abstrak daripada kertas projek yang dikemukakan kepada Fakulti Perubatan Veterinar untuk memenuhi sebahagian daripada keperluan kursus VPD 4999- Projek

KESAN SERBUK HERBA, *Ferula asafoetida*, PADA KADAR KEHAMILAN TIKUS

Oleh

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2016

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Tikus merupakan vector utama dari lepto spira dan pelbagai lagi penyakit bawaan vektor.Menurut laporan dari Persatuan Kawalan Haiwan Perosak di Malaysia, populasi tikus di Kuala Lumpur pada tahun 2010 adalah 4.4 juta dan tahun2013 sebanyak 6.8 juta. Walaupun jumlah tangkapan dilakukan secara besar-besaran, populasi vector ini tidak berkurangan dan sebab utama ialah kapasiti pembiakan tikus yang sangat pesat. Salah satu cara untuk mengawal pembiakan populasi tikus ini adalah dengan menggunakan herba, *Ferula asafoetida*, yang mempunyai ciri kontraseptif. Oleh itu, kajian ini bertujuan untuk melihat kesan serbuk *Ferula asafoetida* pada kadar pembiakan tikus. Seekor jantan dan enam

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ekor betina tikus jenis Sprague dawley telah digunakan untuk kajian ini.Tiga ekor betina telah diberikan 400 mg serbuk *asafoetida* dicampur dalam air setiap hari,manakala tiga ekor dari kumpulan kawalan diberi air normal.Haiwan jantan kemudiannya disatukan ke dalam sangkar haiwan betina untuk mengawan.Keputusan menunjukkan peningkatan pesat dalam berat badan, buncit abdomen dan rambut sekitar putting pada tikus kumpulan kawalan.Bagi kumpulan rawatan,tidak ada tanda kehamilan diperhatikan; menjurus kepada dua faktor yang mungkin iaitu *pheromone (bauan)* haiwan betina atau kegagalan implantasi.Kesimpulannya, serbuk *asafoetida* adalah semulajadi, herba yang selamat untuk mengawal populasi tikus dan penyebaran penyakit.

Kata kunci: populasi tikus, *Ferula asafoetida,* kawalan biologi

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ABSTRACT

An abstract of the project paper presented to the Faculty of Veterinary Medicine in partial fulfilment of the course VPD 4999- Project

EFFECT OF HERBAL POWDER, *Ferula asafoetida*, ON THE CONCEPTION RATE OF RATS

By

UmikaKanhye

2016

Supervisor: Dr.Hafandi Ahmad

Co-supervisors:

Assoc. Prof.Dr. Shaik Mohd Amin

Dr.MurugaiyahMarimuthu

Rats are reservoirs for Leptospirosis and many vector borne diseases. According to the Malaysian Pest Control Association, the rat population in Kuala Lumpur, in 2010, was 4.4 million and 2013, 6.8 million. Despite massive trapping, the population did not decrease significantly and the main reason being the rapid rat breeding capacity. One of the ways to control breeding is to use a local herb, *Ferula asafoetida*, which has contraceptive properties. This study aimed to observe the effect of *asafoetida* powder on the conception rate of rats. One male and six female Sprague

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dawley rats were used for this study. Three female were given 400 mg of *asafoetida* powder mixed in water daily as a treatment group, while the other three from the control group were given fresh water. The male was introduced to the female cage for one week mating. Results showed that animals in control group increased their body weight, had distended abdomen and hair loss around the teats. However, for the treatment group there was no pregnancy sign observed; leading to two possible factors,masking of female pheromone or failure of implantation. Thus, this could indicate that *asafoetida* powder is a natural, safe herb to control rat population and the spread of diseases.

Key words: rat population, *Ferula asafoetida*, biological control

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1.0 INTRODUCTION

1.1 Rats (*Rattus*sp.)

Rats are thin long tailed, medium-sized rodents of the family Muridae. They are originated from Asia and Australia but are now found all over world. The best known rat species to humans are the black rats, *Rattusrattus*, and the brown rats, *Rattusnorvegicus*. Both black rats and brown rats are omnivorous consuming nearly anything digestible, especially store grains. However, brown rat prefers carnivorous diet, aggressively pursuing a wide variety of prey including shrimp, snails, mussels, insects, bird eggs and young, amphibians, eels, fish, pheasant, pigeons, poultry, rabbits, and carrion. Rats find shelter around pipes, behind walls, near garbage cans, in deep rock crevices and in dwellings from small village huts to large city buildings (Musser, 2014).

1.2 Rat population in Malaysia

According to the Malaysian Pest Control Association, the estimated rat population in metropolitan Kuala Lumpur, in 2010, was estimated at 4.4 million and in 2013, 6.8 million rats (Kuala Lumpur City Hall report, 2013).The common sightings of rodents in eateries, residential areas, markets, recreational parks and many other places in broad daylight in the cities (Kuala Lumpur, Johor Bahru, Georgetown) is a clear indication that the rat population has increased many

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fold.According to an estimate by a local renown rodent biologist there are eight rodents to one person in the country (Liat, 2013)

1.3Effects on human

A scientific literature search on rodent diseases revealed that rodents are reservoirs for about 70 different types of diseases spread to humans worldwide.These diseases are spread to human directly due to a bite wound by a disease carrying rodent or indirectly via consuming food or water that have been contaminated with rodent feces and urine.

Rats have been identified as the main cause of leptospirosis in livestock and human according to a study published by the Malaysian Society of Parasitology and Tropical Medicine. In 2012, there were 3,665 cases of leptospirosis reported by the Health Ministry's disease control division. Whilst in 2010, there were 1,976 cases recorded with 69 deaths and in 2011, 2,268 cases with 55 deaths. For 2013, during the increase in rat population the leptospirosis cases also increased by almost two times with a number of 4457 cases and 71 deaths (Ministry of Health Malaysia, 2013). Foreign experts said that the control of the rat population is critical in preventing outbreak of leptospirosis(Bahaman 2000)

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1.4 Control of rat population

The two most common control methods are poisoning and hunting and trapping. For poisoning, various bait mixtures were used in early time and this included sodium arsenite, thallium sulphate and zinc phosphide. However, behavioural resistance (bait avoidance) was observed few years later after the implementation of this control technique. This implied that the rats refused to take the usually attractive baits in lethal quantity. This behaviour appeared to be heritable leading to the failure of this technique (Greaves, 1994). Nonetheless, at present new bait mixtures are prepared and given in food materials like rhinoceros beetle (Oryctes rhinoceros) grubs and many more.

The second technique, hunting and trapping, showed some success in reducing the rat population. However, with an increasing population, more resources were needed to effectively control the population size. The Municipal Council of Penang Island (MPPP) reported that 14,639 rats were caught and killed in 2009. In 2013, with a population of 6.8 million, poison and traps were no longer effective as control methods.

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1.5Biological control

An early approach to control rat population, beside bait poisoning, was the introduction of Barn owl (*Tytoalba*). In one study by Smal in 1990, 99.4 % of owl's diet was found to be rats. This approach showed a decrease in the population, however with a shortage of nesting sites limited the growth of barn owl populations (Duckett 1991, in Smith 1994).Study done by Smal (1990) reportedthat one breeding pair per 6 to 8 ha was required for owls to effectively control rat populations.Therefore the introduction of nest boxes (one per 5 ha) increased the owl density to the requisite level and it was the aggregation and dispersal of non-breeding juvenile owls that enabled the predator to respond to fluctuations in rat densities.

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