



**UNIVERSITI PUTRA MALAYSIA**

***TOXOPLASMA GONDII INFECTION IN LOCAL AYAM KAMPUNG IN  
AREAS OF SELANGOR AND MELAKA***

**MOHAMMAD SABRI BIN ABDUL RAHMAN**

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***TOXOPLASMA GONDII* INFECTION  
IN LOCAL *AYAM KAMPUNG*  
IN AREAS OF SELANGOR AND MELAKA**

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A project paper submitted to the Faculty of Veterinary Medicine,  
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for the DEGREE OF DOCTOR OF VETERINARY MEDICINE

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## **CERTIFICATION**

It is hereby that we have read this project paper entitled “*Toxoplasma gondii* infection in local *Ayam Kampung* in areas of Selangor and Melaka”, by Mohammad Sabri Bin Abdul Rahman and in our opinion it is satisfactory in terms of scope, quality, and presentation as partially fulfillment of requirement for the course VPD4999 – Final Year Project.

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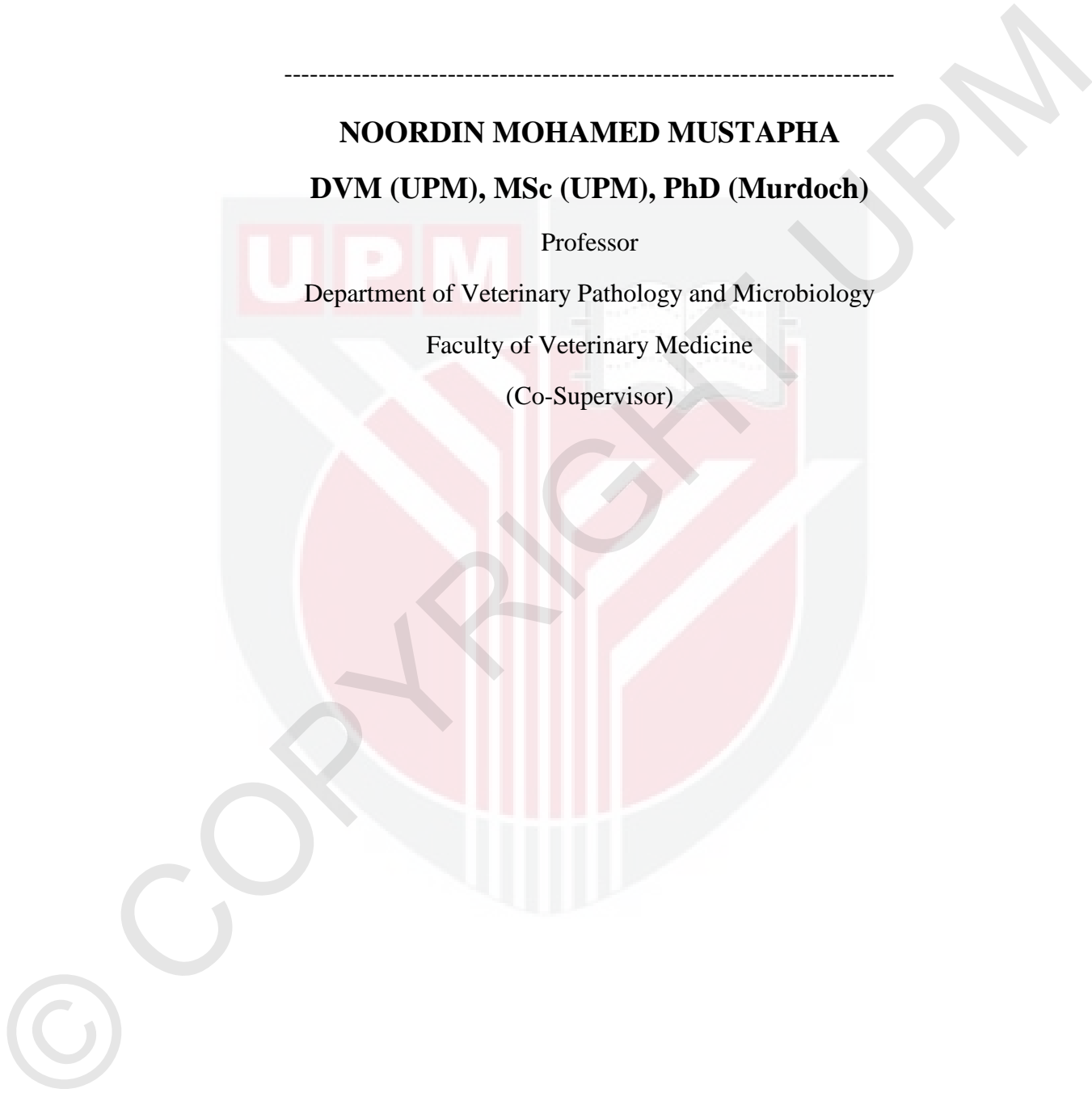
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**DEDICATION**

*I would like to dedicate this thesis to my mother, Sa'adiyah Samad and my father, Abdul Rahman Autan. Without their kindness, generosity, and encouragement I would have been ploughing land in a remote village in Malaysia.*



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**LIST OF ABBREVIATIONS**

ELISA	Enzyme-linked immunosorbent assay
IFAT	Indirect fluorescence antibody test
IHAT	Indirect haemagglutination test
MAT	Modified agglutination test



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## ABSTRAK

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

### **Jangkitan *Toxoplasma gondii* dalam Ayam Kampung di kawasan Selangor dan Melaka**

Oleh

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2015

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**Penyelia bersama: Dr. Reuben Sunil Kumar Sharma**

**Prof. Dr. Noordin Mohamed Mustapha**

Toksoplasmosis adalah zoonosis disebabkan oleh protozoa *Toxoplasma gondii* yang menjejaskan manusia dan haiwan. Ayam Kampung (*Gallus domesticus*) adalah salah satu haiwan yang dikatakan penting bagi epidemiologi toksoplasmosis. Kajian ini dibuat untuk menentukan kehadiran dan organ lazim dalam jangkitan *T. gondii* serta perubahan tisu yang berkaitan dengan menggunakan kaedah serologi dan histopatologi. Sebanyak 50 sampel serum ayam kampung dari Selangor (20 ekor ayam dari empat ladang) dan Melaka (30 ekor ayam dari enam ladang) dikumpul dan dianalisis dengan

menggunakan kit serologi. Secara keseluruhan sampel positif antigen *T. gondii* adalah 20% (Selangor-30%; Melaka-13%) berdasarkan ujian ELISA dan antibodi seropositif terhadap anti-*T.gondii* juga dikesan pada semua sampel positif untuk ELISA berdasarkan ujian penghemaglutinatan tidak langsung (IHAT). Dalam pemeriksaan histopatologi, sista tisu dan perubahan tisu seperti inflamasi dan degenerasi (nekrosis) yang dapat diperhatikan pada kadar 18% (9 ekor ayam) pada otak, 22% (11 ekor ayam) pada hati dan 10% (5 ekor ayam) pada limpa. Keputusan menunjukkan bahawa *T. gondii* berada di dalam hati lebih kerap daripada tisu lain. Kajian ini merupakan laporan pertama jangkitan *T. gondii* dalam ayam kampung di Malaysia.

Kata kunci: *Toxoplasma gondii*, Zoonosis, Ayam Kampung, Serologi, Histopatologi.

## ABSTRACT

An abstract of the project paper presented to the Faculty of Veterinary Medicine, UPM in partial requirement for the course of VPD 4999 – Project.

### ***Toxoplasma gondii* infection in local *Ayam Kampung* in areas of Selangor and Melaka**

By

**Mohammad Sabri Bin Abdul Rahman**

**2015**

**Supervisor: Assoc. Prof. Dr Latiffah Hassan**

**Co-supervisor: Dr Reuben Sunil Kumar Sharma**

**Prof. Dr. Noordin Mohamed Mustapha**

Toxoplasmosis is a worldwide zoonosis caused by the protozoa *Toxoplasma gondii* which affects human and animals. Local *Ayam Kampung* or free-range chickens have recently been reported to be important in the epidemiology of toxoplasmosis. This study determines the presence and common sites of *T. gondii* infection and related tissue changes using serological and histopathological methods, respectively. A total of 50 serum samples from local *Ayam Kampung* (*Gallus domesticus*) from Selangor (20 chickens from four farms) and Melaka (30 chickens from six farms) were collected and analyzed by using serological kits. *T. gondii* antigen was detected in 20% (Selangor-

30%; Melaka-13%) samples using ELISA test and anti-*T. gondii* antibody was detected in all positive samples from ELISA using the indirect haemagglutination test (IHAT). From the histopathological examination, cysts and tissue changes such as inflammation and degeneration (necrosis) were observed in 18% (9 chickens) of brain samples, 22% (11 chickens) of liver samples and 10% (5 chickens) of spleen samples. The results indicate that *T. gondii* tend to localize in the liver more often than in other tissues. This is the first report of *T. gondii* infection in local *Ayam Kampung* in Malaysia.

Keywords: *Toxoplasma gondii*, Zoonosis, *Ayam Kampung*, Serological, Histopathological.



## 1.0 Introduction

Toxoplasmosis is a common infection in animals and humans caused by *Toxoplasma gondii* (Susana, 2012). *T. gondii* is an obligate intracellular protozoan that infects humans and a wide range of mammals and birds (Smith and Reduck, 2000). From Dubey (2010), *T. gondii* is a coccidian parasite with cats as the definitive host, and warm-blooded animals as intermediate hosts. There is only one species under the genus of *Toxoplasma* which is *T. gondii*. The life cycle of *T. gondii* includes asexual multiplication in the intermediate host and sexual reproduction in the definitive host. Many species of warm-blooded animals can act as intermediate hosts and, seemingly, many animal species may be carrying tissue cysts of this parasite. Cats and wild felids are the only definitive hosts that may pass oocysts through their feces which will sporulate in the environment before becoming infective (Dubey, 2010). All hosts, including humans, can be infected by three different life cycle stages of the parasite: tachyzoites, bradyzoites contained in tissue cysts and sporozoites contained in sporulated oocysts (Dubey, 2007).

*Ayam Kampung* or free-range chickens are considered as one of the best indicators for soil contamination with *T. gondii* oocysts because of their feeding habits and their resistance from developing clinical symptoms. Chicken meat is consumed widely all over the world, and consumption of uncooked or not properly cooked chicken meat is a risk for *T. gondii* infection in humans and other animals (Dubey, 2010). The recent trend of consumers demanding meat from organically grown free-range chickens will increase

the prevalence of *T. gondii* in humans if meat was not properly cooked (Dubey and Jones, 2008). MARDI (2012) reported that *Ayam Kampung* constitute 5% of local chicken market but there is increasing demand for *Ayam Kampung* because their meats are said to be more delicious, lean, less fat and organic.

### 1.1 Rationale of the study

Toxoplasmosis is a serious zoonosis caused by *T. gondii* had recently been associated with mental disorder (Lovetta *et al.*, 2013). Free-range chicken meats are popular and increasing in popularity worldwide, furthermore, free-range chickens have been found to harbour *T. gondii* infection in other countries as reported by Dubey (2010). In Malaysia, no information is available on *T. gondii* infection in local *Ayam Kampung*, therefore the risks of infection is unknown.

### 1.2 Hypothesis and objectives of the study

*T. gondii* can be detected using serological or histopathological methods. The prevalence of toxoplasmosis among local *Ayam Kampung* is unknown, therefore this study was undertaken to:

1. Determine the presence of *T. gondii* infection among local *Ayam Kampung* in areas of Selangor and Melaka.
2. Determine the most common sites of *T. gondii* infection and related tissue changes.

## 7.0 References

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