



UNIVERSITI PUTRA MALAYSIA

***OCCURRENCE OF
CORYNEBACTERIUM ULCERANS AND PASTEURELLA
MULTOCIDA
IN PET CATS AND DOGS IN KLANG VALLEY, MALAYSIA***

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OCCURRENCE OF
CORYNEBACTERIUM ULGERANS* AND *PASTEURELLA MULTOCIDA
IN PET CATS AND DOGS IN KLANG VALLEY, MALAYSIA

NG GEOK LIM

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It is hereby certified that we have read this project paper entitled “Occurrence of *Corynebacterium ulcerans* and *Pasteurella multocida* in Pet Cats and Dogs in Klang Valley, Malaysia”, by Ng Geok Lim and in our 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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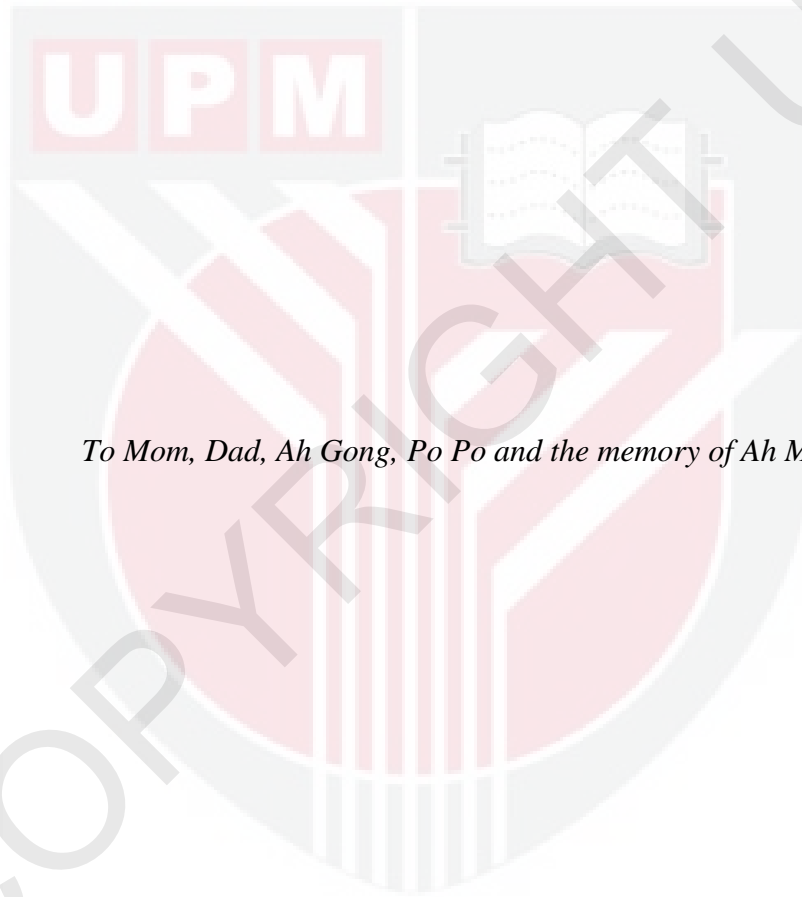
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To Mom, Dad, Ah Gong, Po Po and the memory of Ah Mah.

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ABSTRAK**KEHADIRAN *CORYNEBACTERIUM UL CERANS* DAN *PASTEURELLA
MULTOCIDA* PADA KUCING DAN ANJING KESAYANGAN DI LEMBAH****KLANG, MALAYSIA**

Oleh

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2015

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Haiwan kesayangan terutamanya kucing dan anjing boleh membawa bakteria seperti *Corynebacterium ulcerans* dan *Pasteurella multocida*. *Corynebacterium ulcerans* boleh menghasilkan toksin difteri dan menyebabkan penyakit mirip difteri pada manusia. Ini merupakan ancaman kesihatan awam bagi banyak negara maju, dengan kejadian lebih tinggi daripada difteri yang disebabkan oleh *C. diphtheriae*. *Pasteurella multocida* sering dikaitkan dengan luka gigitan dan cakaran kucing dan anjing. Jangkitan luka boleh membawa penyakit yang teruk atau kematian pada manusia. Oleh itu, kajian ini dijalankan untuk menentukan kehadiran *C. ulcerans* dan *P. multocida* pada kucing dan anjing kesayangan dan profil kerintangan antibiotik di Lembah Klang, Malaysia. Sampel hidung dan faring daripada haiwan kesayangan yang terdiri daripada 26 kucing dan 29 anjing yang kelihatan sihat di empat kemudahan veterinar di Lembah Klang telah diambil. Bakteria yang diasingkan diuji terhadap enam antibiotik yang biasa digunakan dalam amalan haiwan kesayangan. *Corynebacterium ulcerans* tidak diasingkan (0%)

dalam kajian ini manakala kehadiran *P. multocida* adalah rendah (10.9%). Hasil kajian menunjukkan peratusan kerintangan antibiotik yang rendah kepada amoxicillin-clavulanic acid, tetracycline, trimethoprim-sulfamethoxazole dan cephalexin untuk *P. multocida* (16.7% untuk setiap satu). Kajian ini menunjukkan risiko zoonotik berkaitan dengan kucing dan anjing kesayangan. Kesedaran dalam kalangan pemilik haiwan kesayangan harus disebarkan. Kajian ini adalah kajian pertama yang menerangkan pengasingan dan kerintangan antibiotik *C. ulcerans* dan *P. multocida* dalam kucing dan anjing kesayangan di Malaysia.

Kata Kunci: *Corynebacterium ulcerans*, *Pasteurella multocida*, kucing, anjing

ABSTRACT**OCCURRENCE OF *CORYNEBACTERIUM ULCERANS* AND *PASTEURELLA MULTOCIDA* IN PET CATS AND DOGS IN KLANG VALLEY, MALAYSIA**

by

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Supervisor: Prof. Dr. Saleha Abdul Aziz

Pets especially cats and dogs are reservoirs for *Corynebacterium ulcerans* and *Pasteurella multocida*. *Corynebacterium ulcerans* can produce diphtheria toxin and cause diphtheria-like symptoms in human. It is an emerging public health threat in developed countries, with incidence sometimes higher than that of *C. diphtheriae*. *Pasteurella multocida* is often associated with bite wounds and scratches which causes infections that lead to significant morbidity and mortality in humans. Therefore, this study was carried out to determine the occurrence of *C. ulcerans* and *P. multocida* in pet cats and dogs in Klang Valley, Malaysia and their antibiotic resistance profiles. Nasal and pharyngeal samples were collected from apparently healthy animals consisted of 26 cats and 29 dogs which were presented in four veterinary health care facilities in Klang Valley. The isolates were tested against six antibiotics commonly used in small animal practice. *Corynebacterium ulcerans* was not isolated (0%) in this study whereas the occurrence for *P. multocida* was low (10.9%). Low antibiotic resistance were observed for amoxicillin-clavulanic acid, tetracycline, trimethoprim-sulfamethoxazole and

cephalexin in *P. multocida* isolates (16.7% each). This study demonstrated the zoonotic risks associated with pet cats and dogs and awareness among pet owners appears to be necessary. The current study is the first description of the isolation and antibiotic resistance profile of *C. ulcerans* and *P. multocida* in pet cats and dogs in Malaysia.

Keywords: *Corynebacterium ulcerans*, *Pasteurella multocida*, cats, dogs



1.0 INTRODUCTION

Companion animals such as cats and dogs have become members of the family and may become substitutes for childbearing and child care, leading to excessive pet care especially in our modern society. However, pets can also transmit a wide range of zoonotic pathogens including *Corynebacterium ulcerans* and *Pasteurella multocida* infections to human hosts.

Some strains of *C. ulcerans* can produce diphtheria toxin (DT) which causes diphtheria-like diseases in humans (Saeki *et al.*, 2015). It is an emerging threat in developed countries, with incidence sometimes higher than that of *C. diphtheriae* (Katsukawa *et al.*, 2012). There are two forms of diphtheria, i.e. nasopharyngeal form and cutaneous form (Murphy, 1996). *Corynebacterium ulcerans* infection was previously associated with consumption of raw milk and dairy products or contact with cattle. However, *C. ulcerans* diphtheria has been increasingly reported with possible transmission from cats or dogs. Diphtheria rates decreased quickly in many countries that began widely vaccinating starting in the 1920s. However, the circulation of diphtheria seems to continue even in populations with more than 80% childhood immunization rates (CDC, 2014). In 2013, 4680 cases of diphtheria were reported worldwide to the World Health Organization (WHO), four of them from Malaysia (WHO, 2014).

Pasteurella multocida has been isolated as part of the normal oral and pharyngeal flora of many animals, including cats and dogs. In both animals and humans, *P. multocida* is often associated with acute to chronic infections that can lead to significant morbidity

when it manifests as pneumonia, atrophic rhinitis, dermonecrosis, cellulitis, abscesses, meningitis, and/or haemorrhagic septicaemia, and may lead to mortality (Wilson and Ho, 2013). *Pasteurella multocida* infection cases in humans in Europe and America are mostly infected bites or scratches from animals, usually cats and dogs. Other diseases that can develop include respiratory tract diseases, urinary tract infections, sepsis or meningitis (Arashima and Kumasaka, 2005). Kumar *et al.* (1990) also mentioned that pasteurellosis can be fatal with an overall mortality rate of 30% among reported cases. Besides bites and scratches, several reports have described that close contact with pets, including sharing a bed, being licked by, or kissing the pets can lead to human infections (Chomei and Sun, 2011). Close contact with pets especially cats and dogs appears to raise public health concern with the risk of disease transmission.

The hypothesis of this study was that the occurrence of *C. ulcerans* and *P. multocida* in pet cats and dogs in Klang Valley, Malaysia is low.

Therefore, the objectives of this study are to determine the occurrence of *C. ulcerans* and *P. multocida* in pet cats and dogs in Klang Valley, Malaysia and their antibiotic resistance profiles.

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