UNIVERSITI TEKNOLOGI MARA

SPATIAL AND TEMPORAL DISTRIBUTION OF *AEDES SP.* IN OUTBREAK AND NON-OUTBREAK AREAS AT GUGUSAN MANJOI, IPOH

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In the name of Allah, The Most Gracious, The Most Merciful

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ABSTRACT

Malaysia experiences tropical climate and is conducive for breeding ground and development of *Aedes* mosquitoes, known vector for dengue. Dengue fever is one of the most important health problems and represents a large economic consequences and health services in developing countries due to burden to hospitals, work absenteeism and risk of death of symptomatic cases. The objective of this study is to determine the mosquito abundance, the relationship between environmental parameters and climate to the occurrence of dengue fever transmission. Spatial and temporal *Aedes sp*. infestation studies was conducted at Kg. Tersusun Jelapang Jaya and Kg. Manjoi where the distance radius between them is about 2.3 km. These two villages are located in the Gugusan Manjoi, the largest urban cluster of settlements in Perak. Prior the study period, Kg. Tersusun Jelapang Jaya recorded a total of 39 reported cases. On the contrary, no cases had been reported for Kg. Manjoi even though they shared similar geographical, socio-economical and climatic conditions. In this study, the relation of spatial and temporal infestation of *Aedes sp.* with environmental parameters that include temperature, rainfall and incidence rate of dengue fever was determined. Vector surveillance through Ovitrap Index (OI) was calculated to determine the density of *Aedes sp*. mosquitoes in both villages. Ovitrap Index (OI) data at dengue outbreak Kg Tersusun Jelapang Jaya might be affected by fogging activities, thus vector surveillance through the determination of the *Aedes* Index (AI), the *Breteau* Index (BI) and the Container Index (CI) were carried out to assist in determining the level of infestation of *Aedes sp*. in the area. In general, monthly rainfall distribution had a strong correlation with the occurrence of dengue fever. Temperature and rainfall have moderate significant correlation with the density of egg / larvae but is found to be insignificant with dengue fever incidence rates.

Keywords: *Aedes sp. infestation, dengue fever, reported cases, vector surveillance, climate, urbanization*

CHAPTER 1

INTRODUCTION

1.1 Background of Study

According to WHO, vector-borne diseases continue to spread and threaten the lives of millions of people (World Health Organization, 2014). Today, mosquitoes have an almost worldwide distribution and being found throughout the tropics and temperate regions, especially in developing countries in Africa, Asia and South America. (Kraemer *et al.,* 2015). WHO 2017 recorded about 1.4 million deaths per year related to mosquito-borne diseases and 17.0% of all infectious diseases worldwide which make it as most important medical problems.

Infective virus can be harmful to human through the mosquito bite that cause sickness and death through the diseases such as Dengue Fever, Malaria, Filariasis, Yellow Fever, and Japanese Encephalitis (World Health Organization, 2017). Yearly, dengue is widespread throughout the tropics and around 50 to 100 million dengue cases reported occur in more than 100 endemic countries. Dengue is endemic in ten out of eleven countries in WHO South-East Asia Region, with the exception of Democratic Republic of Korea (Nujum *et al.,* 2016).

Four countries in the Western Pacific Region with the highest number of cases and deaths are Cambodia, Malaysia, Philippines, and Vietnam (Wartel *et al.,* 2017). In 2016, there was a huge dengue epidemic outbreak worldwide. More than 375,000 suspected cases of dengue reported in Western Pacific Region, of which Philippines reported 176,411 cases. Malaysia reported 100,028 cases, representing a