

Research report

Subject of study and survey of mosquitoes in closed sewer areas. And an open drain

by

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Regarding the type of mosquitoes in the area, closed sewers and open drains.

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### **Abstract**

This research aimed to study mosquito species in closed drainage and open drains and to study the pH effect on the growth of mosquito species. The study site was Ban Don Klang community. Bueng Khong Long Subdistrict Bueng Khong Long District Bueng Kan Province, operated by 1. Measure the pH of the water 2. Study and examine the type of mosquito

The results of the study showed that The drain is closed with an average pH of 8.13, it is a medium base. The number of mosquitoes found was less than an open drain with an average pH of 7.40 as a weak base.

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## Chapter 1

### Introduction

#### Background and importance of the problem

In today's global situation, climate and space change. There are water reservoirs that produce vector-borne mosquitoes, resulting in many different diseases and deaths for humans. Hence, it is imperative that humans be prepared to cope with the changes to come. Including the need to be aware of the reduction of human loss. Thailand is a part of the world where dengue and severe cases die. From breeding sites for mosquitoes coming from closed and open pipes or areas with stagnant water. Mosquitoes carry many diseases such as Aedes mosquitoes carry dengue fever Anopheles mosquitoes carry malaria. Tiger mosquitoes are carriers of elephantiasis. Mosquitoes can reproduce large numbers in a very short time. With the life cycle of eggs - larvae - pupae - adult It takes only 1-2 days in total, causing many serious illnesses, especially in the rainy season. Mosquitoes are very abundant with mosquitoes lay their eggs in water bodies.

As our group is representative of Bueng Khong Long Witthayakhom School and also the people of the Bung Khong Long community. Bueng Khong Long District Bueng Kan Province We noticed that there are many mosquitoes that live in sewers and waterlogged sites that are closed and open pipes Therefore, our group is interested in studying the mosquitoes living in closed sewers and open drains that relate to the type of mosquitoes in sewers that cause vectors and diseases. Follow

#### Research objectives

1. To study the pH value that affects the growth of mosquito species.
2. To study the types of mosquitoes in closed drains and open drains.

## Research question

1. Are mosquitoes different in closed drains and open drains?
2. What are the pH values for mosquitoes in closed and open drains?

## Research scope

In this study The study set the scope of the study as follows.

1. of content This research focuses on the type of mosquitoes and the pH that affects the mosquito species.

2. Area boundary The research area will be studied at Don Klang Village. Bueng Khong Long Subdistrict Bueng Khong Long District Bueng Kan Province Because it is a village with closed gutters and open gutters. With the presence of mosquitoes, we are interested in the study and research of mosquito species in Don Klang village community.

3. Scope of Study - Drains are closed next to Ban Don Klang Pharmacy, Bueng Khong Long District. Bueng Kan Province - The drainage pipe opens the drainage canal at the end of Ban Don Klang, Bueng Khong Long District Bueng Kan Province

4. The population of this research is A mosquito ball in a closed drain beside a drugstore, Ban Don Klang, Bueng Khong Long Bueng Kan Province And an open drainage canal at the end of Don Klang Village, Bueng Khong Long Bueng Kan Province

5. The sample is A mosquito ball in a closed drain beside a drugstore, Ban Don Klang, Bueng Khong Long Bueng Kan Province, totaling 4 and mosquito cubs in the drain, opening the drainage canal at the end of Ban Don Klang, Bueng Khong Long Bueng Kan Province, total of 8 pieces, totaling 12 pieces

**Terminology definition**

**closed drain** means a surface drainage pipe that transfers water from a house to another. So as not to have too much water By this pipe will have a cover

**An open sewer** means to a surface drain that transfers water from a household to another. So as not to have too much water

**Mosquito baby** means to Mosquito larvae that live in water.

**pH** means the value that represents the acid-base. Of substances in various products, the pH is in the range of 1-14, if the pH is less than 7, that substance is acidic, and if the pH is greater than 7, that substance will have a base or alkaline activity, but if The pH value is 7, indicating that the substance is neutral.

**Benefits of the research**

1. Know the type of mosquitoes that live along closed drains and open drains.
2. The PH value suitable for the growth of mosquitoes was known.

## Chapter 2

### Related research documents and works

#### 1. Mosquito baby

The mosquito larva or larva (meaning from the Royal Thai-English dictionary) means the larvae of mosquitoes living in water. When old, comes out of the sheath as a mosquito.

Uncle mosquitoes or larvae (from Thai-English dictionary) means, mosquito larvae living in water. When old, it will fall from the sheath as a mosquito.

#### 2. Life cycle of mosquitoes

There are 3 stages of life cycle of mosquito larvae.

2.1 Mosquito eggs are very small, only about 1 mm. But still can be seen with the naked eye Mosquito eggs differ in appearance. Anopheles mosquito eggs have a clear float. Stuck to the side of the egg to help support the egg to float The Aedes mosquito eggs do not have a buoyant but cling to the walls of the water storage container. The water jars adhere to the edge slightly above the water level. Annoyed mosquito eggs are arranged together in a raft on the water surface. Tiger mosquito eggs cling to the edge beneath the leaves of some aquatic plants. Mosquitoes lay about 100 eggs at a time. The incubation period for about 2 days will come out as larvae.

2.2 The first larvae start when the larvae hatch from the egg. It is very small as a stage 1 larvae. The larvae will then feed to grow and molt into stage 2 larvae which grow in size but have the same shape. The larvae will feed and grow again to become larvae in stages 3 and 4. Each change in phase there is always a molt. When the larvae of phase 4

are fully grown, they will molt last time. Change the robber period. Which looks very different from the comma The larvae phase takes about 6 days. Mosquito larvae have different shapes, features, and adherence to the surface of the water and their eating habits. For example, the Anopheles larvae do not have a breathing tube, only a breathing hole. So they float parallel to the water surface and search for food on the water surface Aedes aegypti larvae have a short breathing tube. An island on the water's surface with its head hanging underwater and looking for food on the bottom. Water storage container The nuisance mosquito larva has a long breathing tube. Island on the water surface with its head hanging underwater as well, but for food suspended in the water.

2.3 The robber has a distinctive shape, which is a big head. Usually it floats still on the surface, but if disturbed, it will move quickly. This robber phase stops eating and is the last stage of life in the water. The robber period takes about 2 days. In order for the larvae to mature before they are molt to become an adult mosquito, the period starts from the mosquito to lay eggs until the adult mosquito. In a humid country like Thailand, it only takes about 10 days, but it also depends on the mosquito type.

### 3. Drain style

3.1 Closed drain means a surface drainage pipe, transferring water from one place to another. So as not to have too much water By this pipe will have a cover

3.2 Open drain means a surface drainage pipe transferring water from one place to another. So as not to have too much water

## Related research

In this study, the researchers conducted research studies from various research papers. Relevant by the study to be used as a guide in the study. And accompanying this study

Achara Janpetch and Waraporn Siwamrongphong (2006, pp. 48-60) study on “Knowledge, Perception and Social Support on Dengue Prevention Behavior of People in Dengue. Nakhon Si Thammarat Municipality Yala, found that the prevention behavior of dengue fever at the Moderate for anti-shock behavior. In the study of self-defense behaviors from dengue fever, a study of mosquito nets was carried out in the middle. Using mosquito repellent, mosquito repellent and repellent But did not specify the details of each method

Pimlada Anansirikasem (2013) Study of Factors Influencing the Identification of *Aedes aegypti* in Households of Nakornchaisri District. Nakhon Pathom Province This study aimed to study the factors affecting the presence of *Aedes aegypti* in the household. The results of the study showed that There were 216 households free of *Aedes aegypti* larvae and households that found mosquito larvae. Pattern number 179 households. Residents of both types of households. Most of them are women who clean the kitchen. 80.6% and 76.0% of households aged 41-50 years or 30.6% and 28.5% marital status Accounted for 72.7 percent

Matiroon Chum (1999) studied the prevalence of mosquito larvae in schools under Phanom District Primary Education Office, Surat Thani Province. The results of the study revealed that 24 schools surveyed had school buildings and teachers' housing, 3.65 percent and 2.74 percent of them were breeding grounds. Respectively, the containers found as a breeding ground for *Aedes* mosquitoes were other outdoor containers and water containers used by 2.66% and 2.43% respectively, the C1 (Container Index) value of 8.37 and the SI (*Stegomyia* Index) poured equal. 19.17 The dachny value of *Aedes* mosquito larvae increased

according to the surveyed containers. C1 and S1 values were not higher than the specified target.

Bukarat and colleagues (2005) studied *Aedes aegypti* larvae in rural Thailand in 1985. It found that small water blisters Capacity up to 200 liters is an important breeding ground for mosquitoes. Water tanks, rainwater, concrete are found in basins and medium-sized blisters are the most abundant. And at the level that makes Dengue fever can spread.

## Chapter 3

### Methods of conducting research

Subject research Types of mosquitoes in the area, closed drains and open drains.

Researchers have conducted research. Follow the steps as follows

#### 1. Research plan

This research It is a survey research. Objective To study the pH value and type of mosquitoes following closed and open drains.

#### 2. Population / Sample

The population of this research is A mosquito ball in a closed drain next to the drugstore, Ban Don Klang, Bueng Khong Long district. Bueng Kan Province And mosquitoes in the sewer open the drainage canal at the end of Ban Don Klang, Bueng Khong Long Bueng Kan Province

#### 3. Research tools

The tools used in this research include

3.1 Microscope

3.2 pH meter (pH meter)

3.3 Devices for scooping mosquitoes

#### 4. Method of operation

4.1 Measure the pH of the water

4.1.1 Measure the pH of the water in the closed and open drains 3 times.

4.1.2 Measure the pH of the water at each point using a pH meter.

4.2 Study and examine the type of mosquitoes.

4.2.1 Prepare equipment for scooping mosquitoes.

4.2.1 Scooping mosquitoes in sewers

- 4.2.2 Travel to the sewer to scoop the mosquitoes.
- 4.2.3 Take the mosquitoes that were acquired to study the type of mosquitoes
- 4.2.4 Prepare equipment to be used to study the type of mosquitoes, such as alcohol mosquito mat tray. A spoon for scooping mosquitoes Microscope camera
- 4.2.5. Use a spoon to scoop the mosquitoes out of the container that holds the mosquitoes and put them on the mosquito tray.
- 4.2.6 Add alcohol to the mosquitoes to make it easier to see the mosquitoes.
- 4.2.7 The camera water goes to the chronoscope, point it down at the mosquito baby and take a picture.
- 4.2.8 Observe the body of the mosquito to determine the type of mosquito.

## Chapter 4 Research results

The purpose of this research is to investigate the pH of the water in which the mosquitoes live. To determine the type of mosquito larvae along the sewer The implementation of the plan was in accordance with the interests of the researchers of the students of Bueng Khong Longwittayakhom School. Bueng Khong Long Subdistrict Bueng Khong Long District Bueng Kan Province To study mosquito cubs in Ban Don Klang community. To meet research objectives The researcher analyzes the data using tables.

**Table 1** shows the pH of the water in the drain.

The place	pH of the water			
	1 st time	2 nd time	3 rd time	median
closed drain	8.1	8.0	8.3	8.13
An open sewer	7.3	7.2	7.7	7.40

**From Table 1**, it was found that the pH of the water in the closed drain area and the open sewer area had a weak base. Closed drains have an average pH of 8.13, and open drains have an average pH of 7.40.

**Table 2** shows the type and number of mosquitoes found.

Sewer style	The time	Types of mosquitoes found				Found number
		Aedes mosquito baby	Anopheles mosquito baby	Tiger mosquito baby	Annoyed mosquito baby	
closed drain	1				/	1
	2				/	1
	3				//	2
An open sewer	1				//	2
	2				//	2
	3				////	4

**From Table 2**, it was found that in the closed drain and open drain areas, all mosquitoes of the same type were nuisance mosquitoes. From both tables it was seen that the water in the open and closed drains had the pH value. The base is the same and there is only one mosquito. It is possible that these young mosquitoes tend to live in the weakly-base water and in wastewater.

## Chapter 5

### Conclusions and recommendations

#### Research findings

This research is a survey research. The objective of this study was to study the types of mosquito cubs in closed drains and open drains. The survey site was a closed drain beside Ban Don Klang pharmacy, Bueng Khong Long district, Bueng Kan Province And an open drainage canal at the end of Don Klang Village, Bueng Khong Long District Bueng Kan Province

The results of the study showed that the pH was weak, the more mosquitoes were found than the medium-base pH. The mosquitoes found in closed drains and open drains are the only nuisance mosquitoes.

#### Discussion

1. When we scooped water into the drain and took a pH measurement, it was found that the open drain had pH 7.4 and the closed drain had pH 8.13, since the drain area was the area where the drain from the dishwasher was received. The household waste water flows down to the i pipe. Bye water makes the pH a weak base, a condition in which mosquitoes thrive. In water bodies where standing water is not clean

2. Species of mosquitoes found in sewers both closed and open, found that only young nuisance mosquitoes, due to nuisance mosquitoes, can grow well in sewage sources. High in organic matter They have good ventilation where Anopheles and Aedes can grow and live in clean water bodies. Without pollution, both mosquitoes were not found in the surveyed waterways.

**Suggestion**

Further research should be studied.

1. Should study mosquito-borne diseases in open sewers and closed drains.
2. It should be studied whether the people in the community have a disease that corresponds to the type of mosquito found or not.

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Annex



open drain Figure



The drain pipe is closed. Figure



Scoop the mosquito in an open drain. Figure



Scooping mosquitoes in a closed drain. Figure



Comparison of water conditions in closed and open drains. Figure





Mosquitoes found in closed sewers Figure



Mosquitoes found in an open sewer