

Research

Subject: Comparative study of types and numbers of mosquito larvae in the Nakprang
rubber plantation agricultural

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Preface

Research report On a comparative study of the types and numbers of mosquito larvae in the Naraprang rubber plantation agricultural area, the researcher has studied Experiment and prepare The objective is to study the types of mosquito larvae in agricultural areas. Which research results and recommendations It will be more or less beneficial to the authors and stakeholders in the application and application of the research. Use it properly As well as create solutions to problems and develop research of those involved in the future.

The researcher would like to thank you Teachers Suthirat Srisongkram, Pattamaporn Khun Kaew and Ms. Tara Suthon from Bueng School, Bueng Khong Longwitthayakhom School Bueng Kan Province Who gives assistance as an educator Tool assistance As well as help in various areas Which made the research work very well carried out and thank you to all agricultural plot owners for allowing the report authors to collect the information

Any value and benefit Caused by this research The researcher wishes to give readers every Those who support and are interested in conducting this research.

Organizers

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Abstract

Research report

Subject to study the types of mosquitoes in agricultural areas

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Location of Bueng Khong Long Wittayakhom School

Survey and study of mosquito larvae species. In the village of Bua Khok Pho Mak Khaeng Subdistrict Bueng Khong Long District Bueng Kan Province By conducting a survey of 3 areas, namely, the rubber plantation, the narang and the agricultural In February 2021, a survey site with mosquito larvae was collected using a mosquito larva collection. It was then examined with a microscope (Microscope). The study found that the rubber plantation found mosquito larvae. Aedes mosquitoes and nuisance mosquitoes have found mosquito larvae Anopheles and annoying mosquitoes And agricultural plots Found the mosquito larva species. Aedes and Anopheles mosquitoes 26 mosquitoes accounted for. Aedes aegypti 46.15% Anopheles mosquitoes 30.76 percent, annoying mosquitoes 23.07 percent.

Keywords: types of mosquito larvae Full-day mosquitoes are carriers of the disease.

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Chapter 1

Introduction

The origin and importance of the problem

Nowadays, agricultural products have become very important to the World economy And is accepted in almost all countries Farmers' official products have grown. Until it quickly became a staple product in the international economy In many countries, agricultural products are ranked 1st to 3rd in that country. This fact is consistent with the growth of agricultural products in Thailand, which in Over the past several decades, Thailand's agricultural income has been the first in revenue over the past several decades. From promoting other products It is realized that the agricultural products of Thailand can It is an economic driving force that has played a prominent role over the past three to four decades. The overall success comes from the relevant parties, both public and private, who have helped to push this agricultural product. Moving forward without stopping And play a leading role in driving the Economic growth Which leads to employment, career creation, income distribution And investing in many related businesses creates wealth for the people and the country in abundance and leads to success in improving the q

uality of life of the people. As a result, Thailand has more agriculture and many agricultural practices in the country, for example, the Northeast has grown rice, sugarcane, cassava, corn, rubber, etc. Which one in the northeast Bueng Kan Province Is the province that grows the most rubber There are rice and agricultural plots respectively, where such agriculture has exposed people to mosquito-borne diseases, and the Southeast is the region with more

mosquito-borne illnesses than any other region. So we surveyed mosquito larvae from rubber, rice and agricultural plots. From the background and the importance of the above problem, the importance of agriculture is increasingly evident. The researcher then selected a survey site for Ban Bua Khok, Pho Mak Khaeng Subdistrict. Bueng Khong Long District Bueng Kan Province There are many agricultural practices such as rice farming, agricultural plots, palm and rubber cultivation. Therefore, the researcher emphasizes the importance of studying "the survey route at Huai Sai, Ban Bua Khok, Pho Mak Khaeng Subdistrict. Bueng

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Khong Long District Bueng Kan Province "to be used as a guideline for agriculture that do different types of agriculture. In order to manage agriculture to prevent disease caused by mosquitoes And propose to local villages that can be studied or developed for benefit, can be organized as a training to educate mosquitoes for villagers of Ban Bua Khok, Pho Mak Khaeng Subdistrict Bueng Khong Long District Bueng Kan Province Gave knowledge and various preventive methods

Research Question

1. Will the survey area find the number of mosquito larvae different in each place?
2. To study the types of mosquito larvae that cause disease affecting mosquito-borne disease.

Research objectives

1. To study the number of mosquito larvae in agricultural areas.
2. To enable people who do careers to be careful from mosquito-borne diseases.

Research benefits

1. Make farmers in the area to be careful and not vulnerable to mosquitoes in that area.
2. Bring the research results to the villagers. In order to allow villagers to know about the types of mosquito babies in various agricultural areas. Research scope

1. Content Scope: This research focuses on exploring with Check for disease-carrying mosquitoes that carry carriers or make the area not vulnerable to disease.

2. Area scope: The research area to be studied is naphrang rubber, agricultural plots at Ban Bua Khok, Pho Mak Khaeng Subdistrict. Bueng Khong Long District Bueng Kan Province Because it is a village with many agricultural plots The village has a high number of mosquitoes and there are areas in the village that may be prone to disease. Therefore, it was made to study and research mosquitoes in this village.

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The location scope is (1) Ban Bua Khok rubber plantation, Pho Mak Khaeng Subdistrict Bueng Khong Long District Bueng Kan Province (2) Na Prang, Huay Sai, Ban Bua Khok, Pho Mak Khaeng Subdistrict Bueng Khong Long District Bueng Kan Province (3) Huai Sai Agricultural Plot, Ban Bua Khok Subdistrict, Pho Mak Khaeng Subdistrict Bueng Khong Long District Bueng Kan Province Scope of the period from 28 January 2021 to 28 February 2021

Chapter 2

Relevant documents and research

The study of documents and research related to the mosquito species and the host agricultural area can be divided into sections as follows:

Part 1 documents related to information of agricultural areas.

1.1 Garden is an area where a lot of plants are planted. Bounded As a general saying, if one wants to say a particular type of garden, there are other words that accompany it specifically, such as durian garden, rubber plantation, rose garden, vegetable garden by implication, meaning a place that looks like that in some In cases such as the zoo, the snake park

1.2 Rubber Garden is an area where many rubber trees are planted. In the area of the owner of Ban Bua Khok rice mill There are about 300 rubber trees in that area, where the mosquito larvae can live, which is the owner's living water jars.

1.3 The second season is farming in the dry season or off the season. Therefore there is water standing due to releasing water into the plot Which is the source of mosquitoes With an area of approximately 2 rai

1.4 Agricultural plots is an area where different types of plants are planted with water in the area of utility equipment. Such as a glass of water, lotus, water car, etc.

Part 2 Documents related to the type of mosquito larvae

2.1 Species and characteristics of mosquito larvae

2.2.1 Mosquitoes, from the survey report, it was found that Around the world there are thousands of mosquitoes. It is estimated that there are 3,500 species in Thailand. There are approximately 400 species. Some mosquitoes are only irritating by feeding humans and pets for food, but there are many other mosquitoes that besides feed on blood. already Is also a

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carrier of various serious diseases To people and animals as well Which is extremely dangerous Upper part of the form Stay

2.1.2. Yellow fever Mosquito larvae. After hatching, the larvae begin to feed Growth and molting 4 times The larvae obtained by molting are higher than the instar, for example the larva that hatched from the egg is called the first instar when the next molt becomes the second instar. 10 days, the last molt becomes a robber or chrysalis, the appearance of a short stout pipe, floating at an angle to the surface Flick motion



Example of Aedes mosquito larvae (<https://www.thairath.co.th/news/local/972028>)

2.1.3. Urban Mosquito larva, fragile body, small size, no pattern on the body. It is the highest of all mosquitoes. They lay eggs in all kinds of water bodies. Adults are active day and night. But most of them go out for their food early in the evening Mosquito eggs are laid in a single

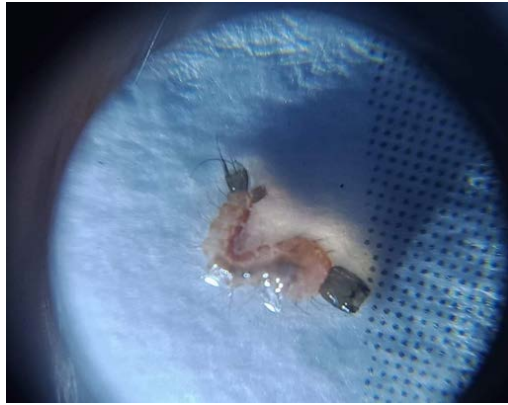
way. Is a raft floating on the surface of the water The eggs hatch in 24 hours, forming larvae and thrive in water. Then it will molt to get into the chrysalis, also known as the robber. And from the robber will emerge as a mosquito The period from ovum to adult takes approximately 9-10 days. Long breathing tubes. Float at an angle to the surface of the water. Move in an S-shaped (S) shae

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Examples of annoying mosquito larvae

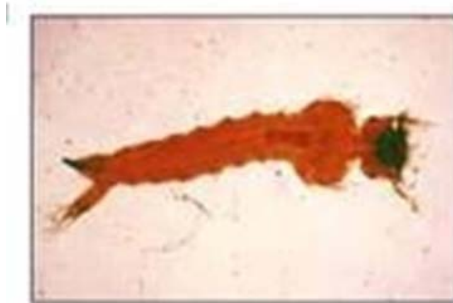
2.1.4. Anopheles larvae There are 4 molts, the last time it becomes a robber, which takes about 13-15 days or more. At low temperatures, the larvae lay parallel to the surface of the water. Fan-shaped hairs called palmate hairs appear on most of the abdominal segments. The function of supporting the larvae to float is a unique feature of the Anopheles larvae without a breathing tube. Float parallel on the water surface, moving straight Switch back and forth to see hard



Example of anopheles mosquito larvae

2.1.5 The family of Tiger mosquitoes or Filaria mosquitoes (Genus *Mansonia*) have a special characteristic on the breathing tube (siphon) with a short cone-shaped, pointed, serrated, saw-blade, used to penetrate the roots of aquatic plants. It has a very strong shut-off valve. Breathe by getting oxygen from the cells of aquatic plants. It takes 16 to 20 days to grow. The short breath tube is sawtooth piercing the roots of water plants Move in an S-shaped (S) shape.

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Example of tiger mosquito larvae

Part 3 Mosquito-borne diseases

2.3.1. Malaria, the source of disease spreading in the forest and mountains. Especially along the border with Myanmar and Cambodia. Malaria is a very small, unicellular protozoa called plasmodium. There are four types of pathogens, but the deadly plasmodium *Fa. Alsipaum*

2.3.2. Dengue fever The location of Phrae Rong can occur in both urban and rural areas in every province across the country. Most of the patients are children. Dengue fever is a virus known as dengue virus. Severe patients die from shock.

2.3.3. Lymphatic filariasis is the source of transmission in rural areas, only in the southern and western regions of the country. Elephant foot disease is a small roundworm. The thread-like shape lives in the patient's bloodstream. This disease causes the arms, feet and testicles to swell. The disability followed, but the disease was not severe to death. This is because the patients with severe symptoms will have large swollen feet like that of an elephant. Therefore called this disease that elephantiasis

2.3.4. Encephalitis, a common source of infectious disease in rural areas, especially in the North, where there is a lot of pig production. This disease normally is contagious in animals only. The infectious disease that can reach people is a coincidence that a person is bitten by a mosquito that has the disease. Encephalitis is a virus known as the Japanese Encephalitis virus, although the number of people with this disease is small. But the disease can easily cause severe symptoms, death, or aphasia.

research Related

1. Survey model predicting the number of dengue fever cases in the Northeast This research was to determine an appropriate equation model for predicting the number of dengue fever cases in the Northeast region. In the first step, select the representative provinces in each group, namely Nakhon Ratchasima, Roi Et, Nakhon Phanom, and then have a group analysis. Information on the number of elective fever patients in the Northeast region in 1981-1993 was using multiple regression analysis method. The analysis was performed using data on the number of people with dengue fever per hundred thousand rainfall. And selected provincial temperature The proper equation is $Y = 05.65X_1 + 00.04X_2 - 26.73X_3 + 75.96$ ($R^2 = 0.60$) Nong Khai Province information. The proper equation is $Y = 14.01X_1 - 00.45X_2 +$

15.63X³ -32.92 (R² = 0.88) Loei province information. The appropriate equation is $Y = 06.36X^1 - 00.12X^2 - 00.29X^3 + 06.44$ (R² = 0.61). For information on Nakhon Phanom and Roi Et, there is no suitable equation.

2. Time and area at risk of bites of mosquitoes, encephalitis.

Study the time of flight Time of bite and the area at risk for biting Of mosquitoes that carry encephalitis Using mosquito traps And figure out the bite rate by using people as prey Chiang Rai at Ban Nong Ping Kai, Bo Na Kham Subdistrict, Mueang District, Kamphaeng Phet Province in 1984-1986 The mosquito-borne flight period The mosquito vector's flight time starts at 19.00 hrs. The most common period is 8:00 p.m. - 9:00 p.m. At the biveand house and stable It was found that the penal area was more vulnerable to mosquito-borne bite than in the house

3. Relationship between the habitat of Anopheles larvae and Vegetation index and surface temperature

this research The objective of this study was to determine the relationship between Anopheles larvae habitat and vegetative index. Species and surface

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temperature and to show the densities of the habitat of the Anopheles larvae in the area were studied in Tha Song Yang District and Umphang District in Take Province. The research method was a qualitative research method. Use the method of requesting information assistance. Data download and Direct field observation (direct field of observation) and analyze spatial data It covers two areas: Tak province, comprising Tha Song Yang District and Umphang District. The content analysis was divided into 2 main points: 1.) The study of the density of habitat of Anophong larvae in Take Province. By dividing education into Time and spatial density. 2.) Analysis of the relationship between the spatial density. The density of the resident anopheles larvae with the vegetation index and surface temperature were analyzed by the method enter multiple regression analysis to determine the relationship of the

anopheles larvae density with the vegetation index. The surface temperature and forecast equations were used to calculate the spatial Anopheles larvae density map. In addition, content analysis explaining the relationship in the study area was divided into two parts, separated by study area as follows: Results of the analysis of the relationship between Anopheles larvae habitat and vegetation index and The surface temperature in Tha Song Yang District, Tak Province in 2013 to 2016 found that the density of The habitat of the Anopheles larvae in Tha Song Yang district

Chapter 3

Operation method Subject

research Study of types of mosquito larvae in agricultural areas. The researcher has carried out the research according to the following steps.

Part 1 Collection of mosquito larvae

3.1 Research plan

This researcher It is a survey research.

3.2 Equipment materials

3.1.1 Three mosquito collectors

3.1.2 Microscope camera

3.1.3 UNIVERSAT TEST PAPER

3.3 Method of operation

Part 1 Study of the Acidity-Base of Water in Agricultural Areas

3.3.1 Study the acidity-base of water in agricultural areas.

3.3.1.1 Collect water samples to each area 3 times per area

3.3.1.2 Take each point of water to measure PH value using Universal test paper

The place	PH Value			Mean
	1	2	3	
Double-crop field				
Rubber plantation				
Agricultural Plots				

Table 1 Example of PH value In farmland

Part 2 Study and investigate the type of mosquitoes.

2.1 To take the mosquito larvae in each area for inspection

2.1.1 Prepare equipment to scoop mosquitoes.

2.1.2 Go to the desired area, which is the natural rubber plantation, agricultural plots.

2.1.3 Survey the surrounding environment

2.2 Take the mosquitoes that were acquired to look at the types of mosquito larvae.

2.2.1 Prepare equipment that will be used to look at mosquitoes, namely, alcohol mosquito mat tray, camera, microscope. Mosquito scoop

2.2.2 Use a spoon to scoop mosquitoes out of the container that holds the mosquitoes. To

2								
3								
sum								

Table 3 Examples of species and numbers of mosquito larvae.

Chapter 4

The results of the black work Performance

1. Results of the study of the acidity-base of water in agricultural areas.

1.1 From the study of the survival-base of water in agricultural areas by measuring the PH value, which obtained the PH value of the water in each area

The place	PH Value			Mean
	1	2	3	

Double-crop field	6	6	6	6.0
Rubber plantation	5.6	6	5	5.66
Agricultural Plots	5	4	5	4.66

Table 4 shows PH values in agricultural areas.

2. The results of the study and examining the type of mosquitoes.

2.2 Results of bringing mosquitoes that were acquired to look at the types of mosquitoes Can know the number as follows

Mosquito	Aedes	Anopheles	Urban mosquito	sum	Percentage
The place					

1	-	/	-	/	-	-	/	-	-
2	-	//	-	/	-	-	//	-	-
3	-	-	/	-	/	-	-	/	-
sum	0	6	2	6	2	0	6	2	0

Table 6 shows the type and number of mosquito larvae.

Note: Instead of 2 mosquito larvae Discussion

Discussion From

the table above, the research survey of mosquito larvae in the agricultural area, the Double-crop field rubber plantation, agricultural plots found that In the rubber plantation there is a pH 6.0 which is weak acid and has a total of 8 mosquito larvae, 6 Aedes aegypti larvae, 2 of the Anopheles larvae, accounting for 46.15% of the second, with a pH of 5.66 which is weak acid and has the number of mosquito larvae. All eight of the Anopheles larvae had 6 Anopheles larvae, 2 nuisance larvae, accounting for 30.76%. The agricultural plots had a pH of 4.66, which is also weakly acidic, and there were 8 mosquito larvae, 6 Aedes and 2 Anopheles. 23.07 is therefore rubber planters Therefore at risk of dengue fever and malaria Farmers are at risk of malaria and farmers are at risk of developing encephalitis.

Chapter 5

Conclusions and recommendations

Research findings

Go to the survey area while collecting the mosquito larvae in the water by using the mosquito larva collection kit. The study found that the rubber plantation found mosquito larvae Aedes mosquitoes and nuisance mosquitoes have found mosquito larvae Anopheles and annoying mosquitoes And agricultural plots Found the mosquito larva species. Aedes

and Anopheles mosquitoes 26 mosquitoes accounted for. Aedes aegypti 46.15% Anopheles mosquito 30.76% Percent annoyed mosquitoes 23.07 It can be found that rubber farmers are most likely to develop dengue fever, as well as farmers and farmers with malaria.

Suggestion

1. Suggestions from this research
2. More time to study.
3. Prepare equipment and tools ready.
4. Study in the rainy season because the rainy season often has mosquitoes, making the number more accurate.
5. Study other mosquito larvae as well. Upper part of the form

Annex



Figure 1 Double-crop field



Figure 2 Agricultural plots



Figure 3 Scooping mosquitoes from the Double-crop field



Figure 4 Put the mosquito larvae from Na Prang in a bottle



Figure 5 Scooping mosquito larvae at agricultural plots



Figure 6 Scooping the mosquito larvae at the rubber plantation

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