MOSQUITO LARVAE AND WATER QUALITIES IN CHIANGRAI PROVINCE, THAILAND

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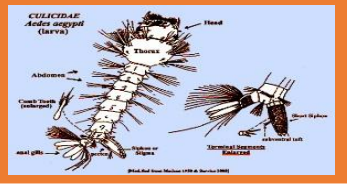
Introduction

Mosquito borne disease in the world

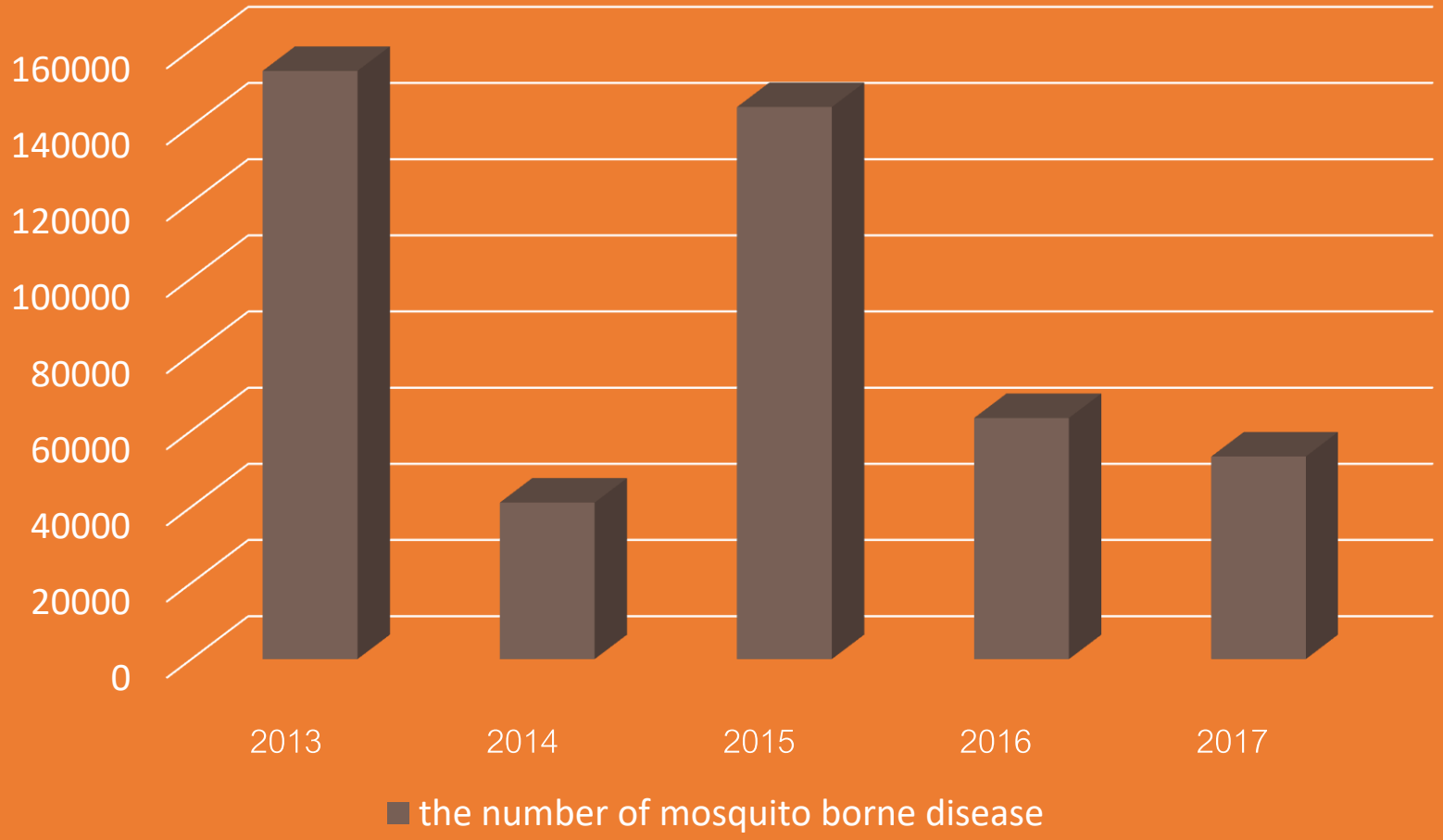
Introduction

Different mosquitoes and diseases

Vector	Diseases	Picture
Aedes spp.	Dengue , Chikungunya and zika virus	
Anopheles spp.	Malaria	
Culex spp.	West Nile virus and Japanese encephalitis	
Armigeres spp.	Japanese encephalitis	

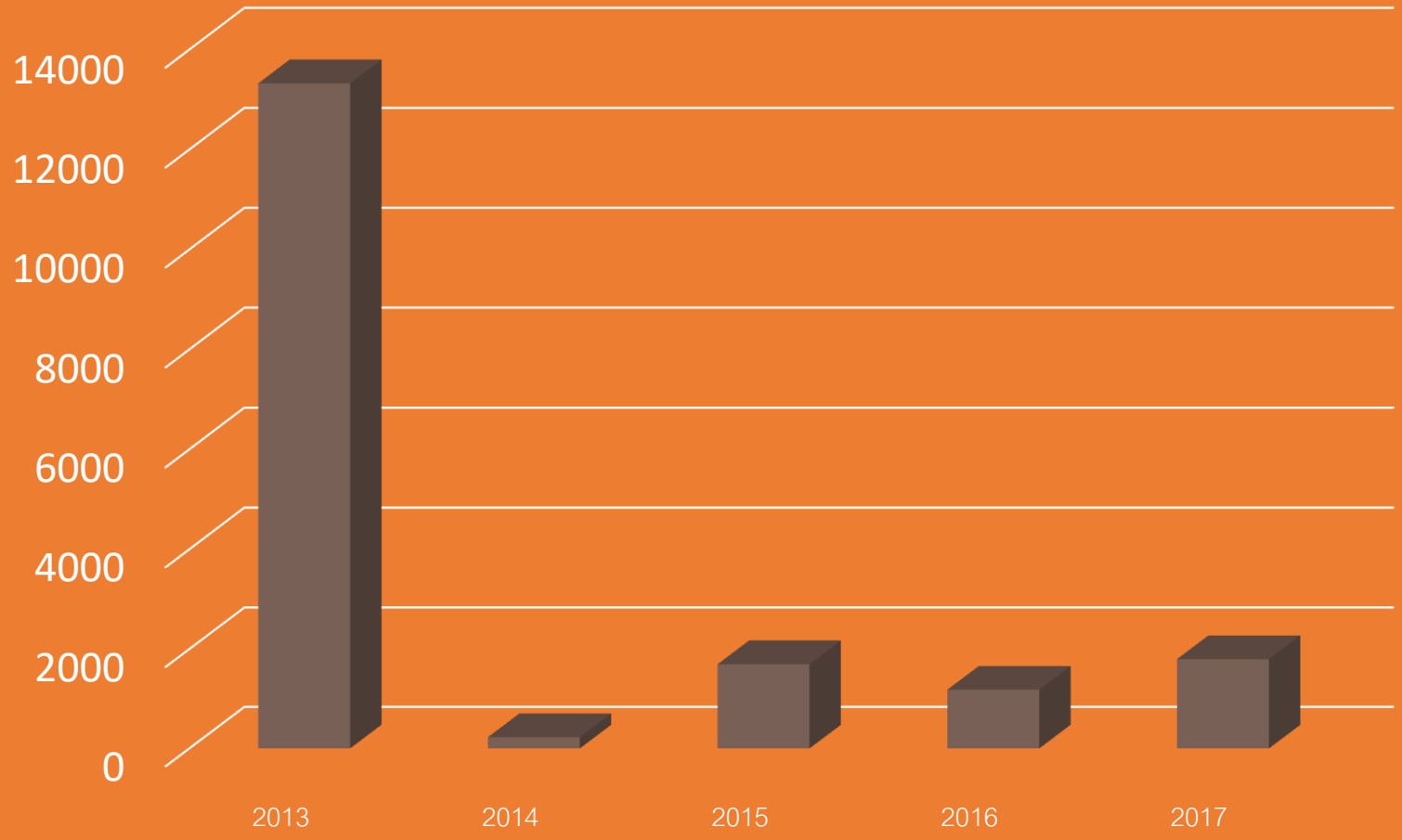
Introduction

Mosquito borne disease in Thailand



Introduction

Mosquito borne disease in Chiangrai



So, we need to conduct research on mosquitoes in Chiangrai

Objectives

- 1. To test the differences in water container types and water qualities (pH, temperature) among different sites (temples and tea gardens) in Chiangrai Province.
- 2. To investigate mosquito species numbers in different sites.
- 3. To make a correlation between container numbers and mosquito larvae numbers.

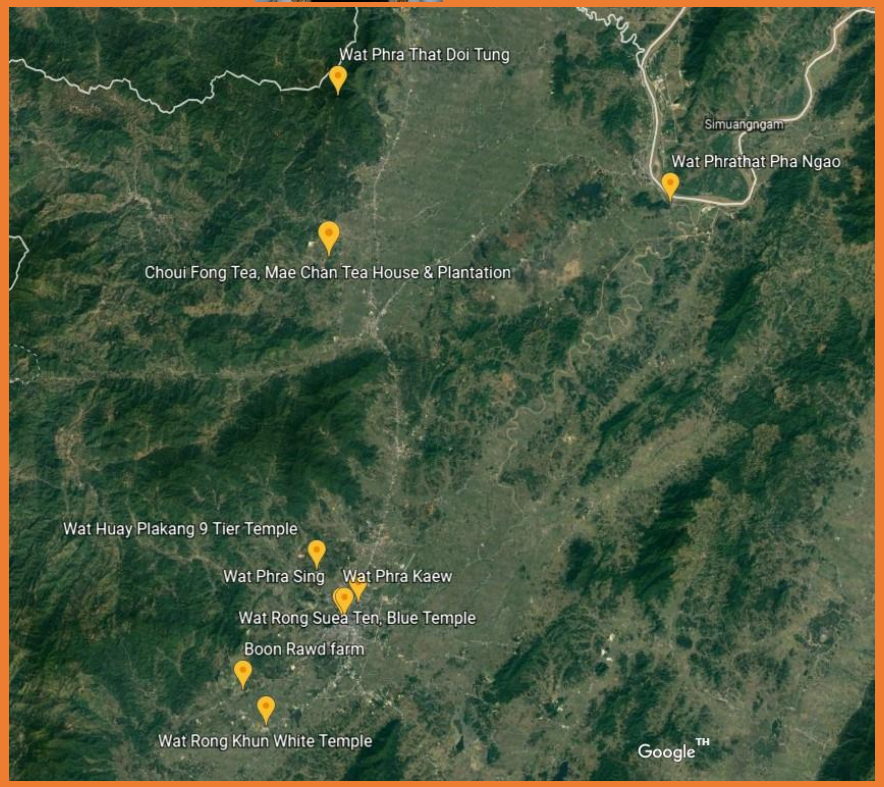
Materials and methods

Data collection

Choui fong tea
Mae chan,Chiangrai

Wat Pra kaew
.Chiangrai

Boon Rawd
farm
.Chiangrai



Wat rong suea ten
Mueang,Chiangrai

Wat Huay Plakung
Mueang,Chiangrai

Wat pathat pha ngao
Chiang Saen,Chiangrai

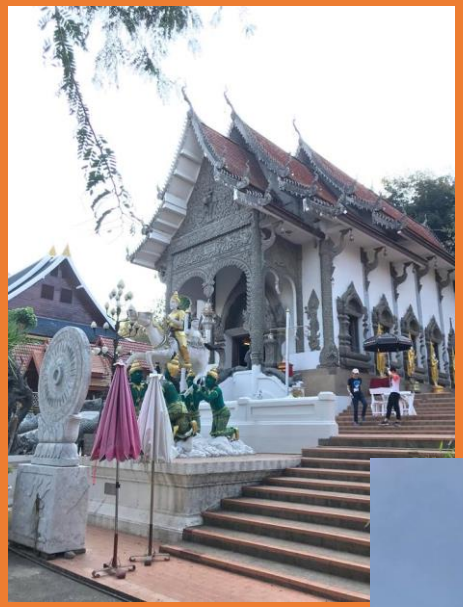
Wat Pra singh
.Chiangrai

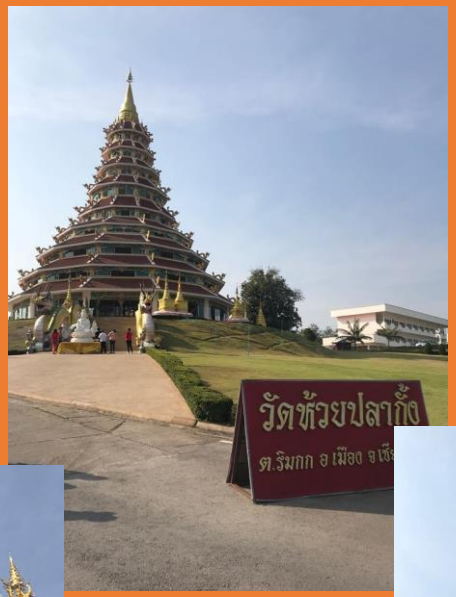
Wat rong
khun
.Chiangrai

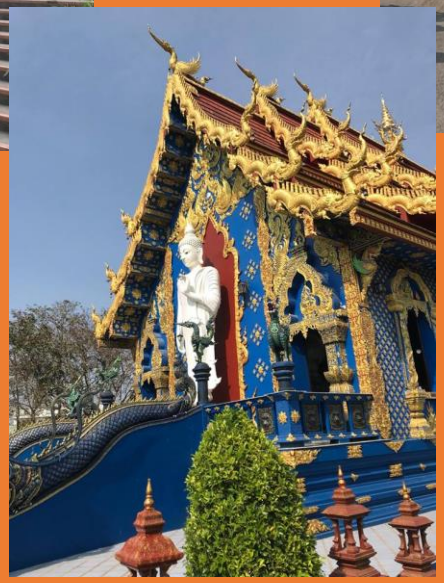
Wat pathat
doi tung
.Chiangrai

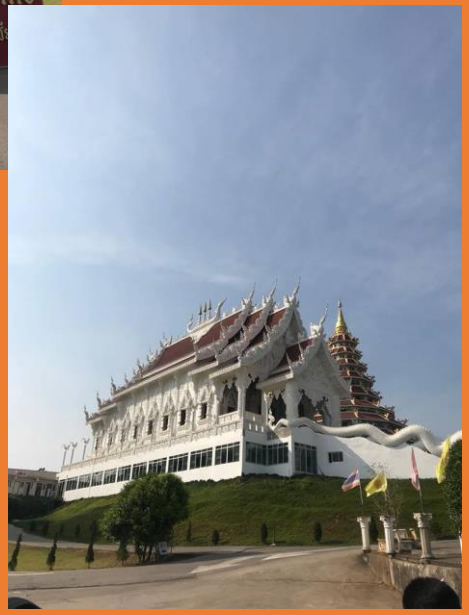
Luck Swan
Resort
.Chiangrai

PICTURES FROM STUDY AREA









Materials and methods
Data collection

1. Measured altitudes of each study site

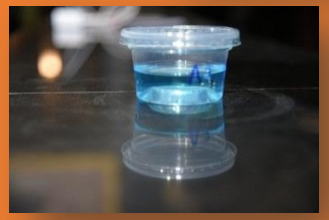
2. Collected mosquito larvae from outside containers

3. Checked water qualities (pH and temperature) of the water

Materials and methods
Data collection

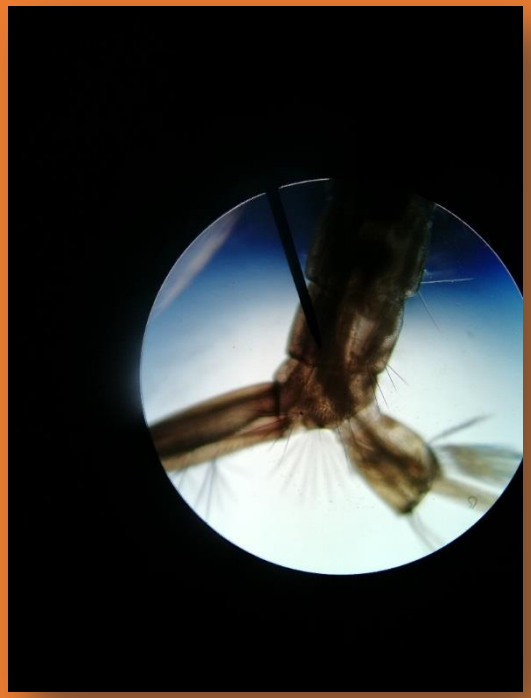
4. Recorded the types (e.g., flower pots, plastic buckets, flower vase) of containers

5. Preserved mosquito larvae in 75% ethanol



6. Identified mosquito larvae under microscope

Identification Under Microscope



Mosquito Larvae

Materials and methods
Data analysis

1. Chi-square test to test the differences in container types among different sites
2. One-way ANOVA tests to test the differences in pH and temperature among different sites
3. Spearman correlation was used to test the relationship between container numbers and mosquito larvae numbers
4. It was not possible to test the differences in mosquito larvae numbers among sites due to small sample size
5. We used SPSS 17 to analyse the data
6. Data were considered as statistically significant at $P<0.05$.

Results

Container types in temples and tea gardens in Chiangrai, Thailand

Study sites	Container types											Chi-Square
	Flower pots	Plant pot plates	Plastic buckets	Fish Pond	Saucer	Bromeliad plant	Earthen jars	Flower vase	Bowls	Water garden	Total containers	
Rong suea ten temple	3	1	3	1	2	1	2	0	0	0	13	$F_{1,72}=187.92$, $P<0.001$
Huay plakang temple	0	2	0	0	0	3	3	0	1	0	9	
Phra that doi tung temple	1	0	0	0	0	0	0	1	1	0	3	
Phrathat pha ngao temple	17	0	0	0	0	0	0	0	0	2	19	
Rong khun temple	0	0	0	1	0	0	0	0	0	0	1	
Phra kaew temple	9	0	1	0	0	0	0	0	0	0	10	
Phra sing temple	4	0	0	0	0	0	1	0	0	0	5	
Choui fong tea garden	0	0	0	3	0	0	0	0	0	0	3	
Boon rawd tea garden	0	0	1	0	4	0	0	0	0	0	5	

Results

Status of mosquito larvae in water containers in temples and gardens:

Sites	*Aedes aegypti*	*Aedes albopictus*	*Culex* spp.	*Toxorhynchites* spp.	*Armigeres* spp.	*Anopheles* spp.
Rong suea ten temple	12 (plastic buckets)	0	209 (plastic buckets)	0	0	0
Huay plakang temple	0	0	0	0	0	0
Phra that doi tung temple	0	0	0	0	0	0
Phrathat pha ngao temple	0	3 (flower pots)	33 (flower pots)	0	0	0
Rong khun temple	0	0	0	0	0	0
Phra kaew temple	0	0	0	5 (flower pots)	75 (plastic buckets)	3 (flower pots)
Phra sing temple	0	0	0	0	0	0
Choui fong tea garden	0	0	0	0	0	0
Boon rawd tea garden	0	0	0	0	0	0

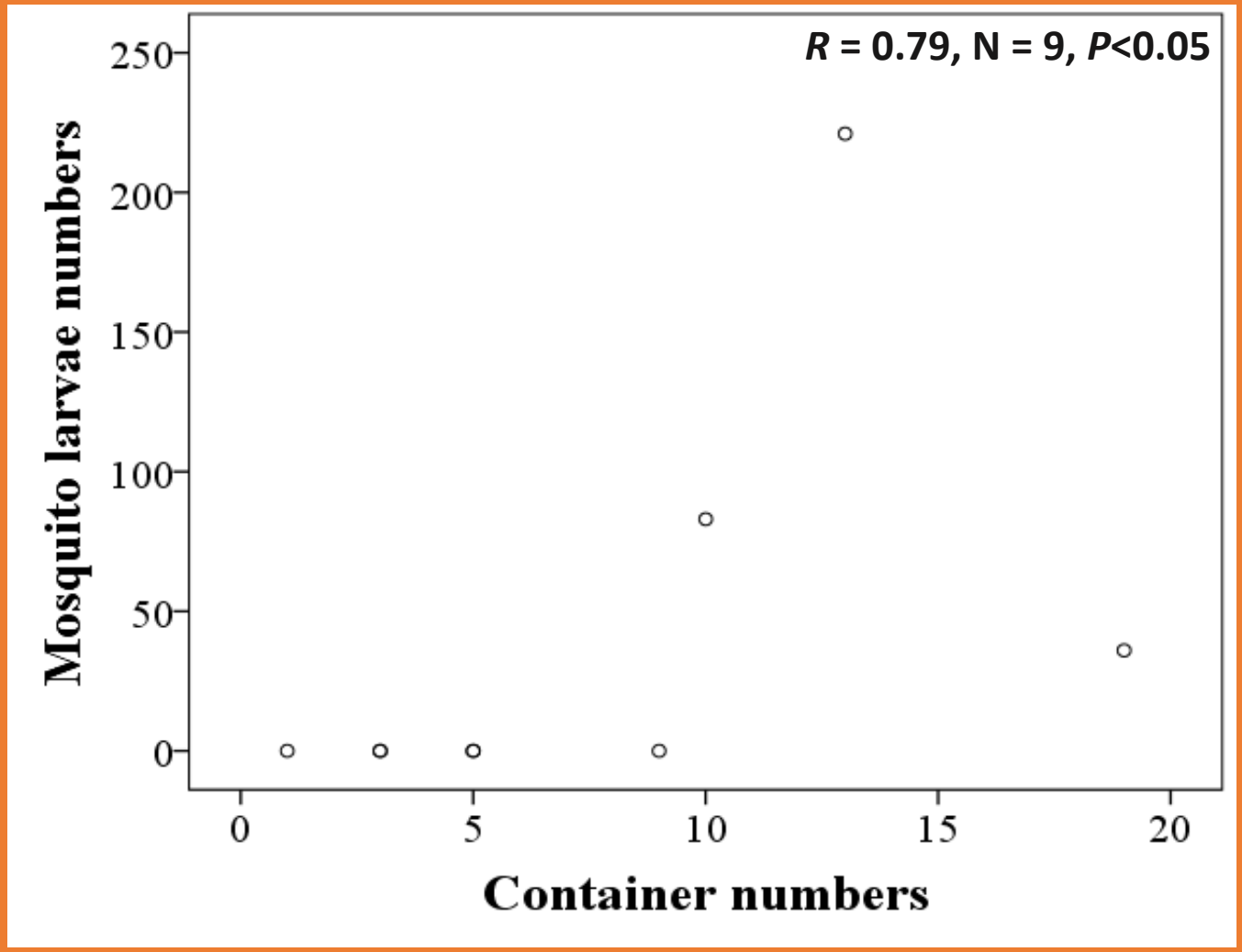
Results

Total mosquito larvae, water qualities and altitudes in temples and tea gardens:

Sites	Total mosquito larvae	pH	Temperature (^{0}C)	Altitudes (m)
Rong suea ten temple	221	6.84±0.58	23.85±0.69	390
Phra kaew temple	83	7.04±0.44	24.00±1.16	390
Phra sing temple	0	7.76±0.08	24.70±0.58	390
Rong khun temple	0	6.00±0.00	25.00±0.00	410
Huay plakang temple	0	6.26±0.83	27.56±1.02	420
Choui fong tea garden	0	6.00±1.00	24.17±0.44	420
Phrathat pha ngao temple	36	7.82±0.13	25.58±0.53	460
Boon rawd tea garden	0	8.00±0.00	25.40±1.60	760
Phra that doi tung temple	0	8.50±0.76	21.67±2.73	1340
Statistical test (One-way ANOVA)	-	$F_{8,59}$=1.80, P>0.05	$F_{8,59}$=2.02, P>0.05	-

Results

Container numbers and mosquito larvae numbers:



Conclusion

1. Container types and numbers were different among different sites in Chiangrai Province, and mosquito larvae numbers increased with increasing of container numbers

2. Though different sites had different altitudes, but pH and temperature did not differ among the sites

3. Among 7 sites, only 3 sites had mosquito larvae, and there were 6 different species of mosquito larvae

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