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Tourism and Dengue Vector:

Would Tourism Increase Mosquito Breeding Sites?



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Dengue incidences

50-
100

million dengue
infections
worldwide
every year

40%

Over 40%
of the world's
population

2.5%

of those
affected die
are children

Thailand

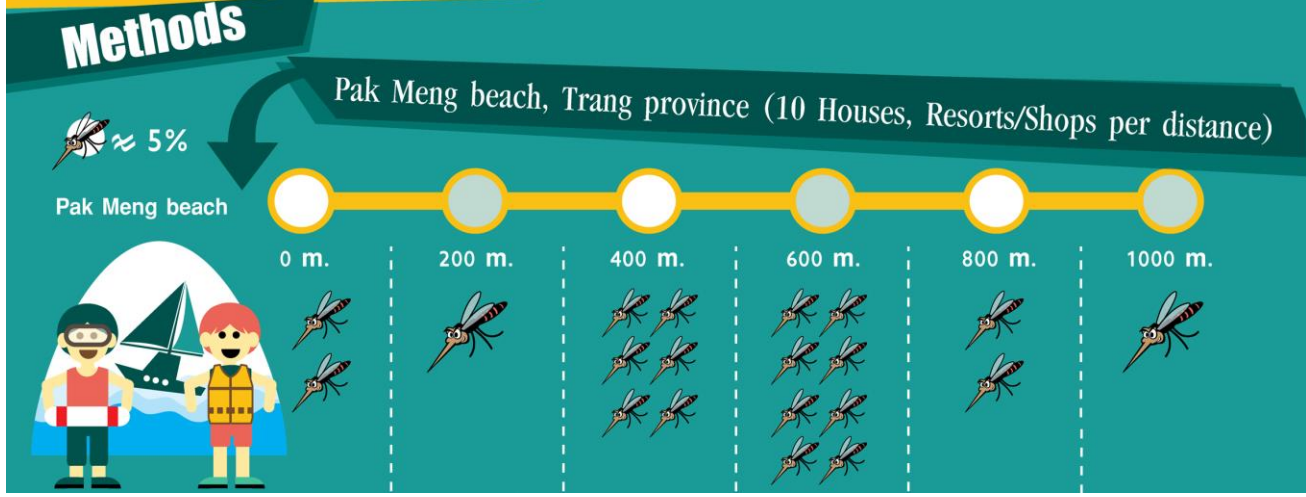
Thailand

2017 Now, **13,961 cases**
(1 january - 18 june)
2016 **63,310 cases**
2015 **144,672 cases**

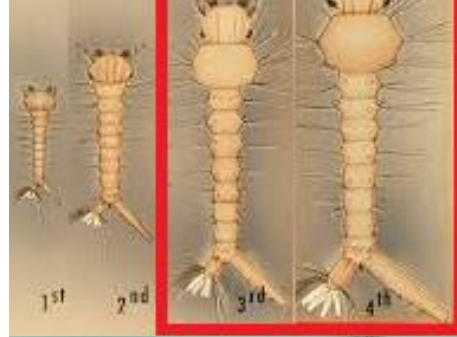
Tourism affecting mosquito

diversity and breeding sites
in southern Thailand





Materials and Methods



Collect larvae

Preservation

Count

Identification

Types and Abundance

Ae. aegypti



0 m.

\bar{X} Shops/Resorts = 19.50

19.23 %

200 m.

\bar{X} Shops/Resorts = 15.00

\bar{X} Houses = 4.00

15.38 %

400 m.

\bar{X} Shops/Resorts = 54.33

\bar{X} Houses = 24.00

1.42 %

600 m.

\bar{X} Shops/Resorts = 55.00

\bar{X} Houses = 40.80

0.32 %

800 m.

\bar{X} Houses = 10.67

31.25 %

1000 m.

\bar{X} Shops/Resorts = 3.00

\bar{X} Houses = 11.67

43.90 %

$\chi^2_5 = 32.18^*$



Ae. albopictus

37.18 %

61.54 %

98.58 %

56.37 %

12.50 %

43.90 %

$\chi^2_5 = 508.51^*$



Culex spp.

43.59 %

23.08 %

42.68 %

54.69 %

12.20 %

$\chi^2_4 = 242.78^*$



Toxorhynchites spp.

$\chi^2_2 = 7.46^*$

$\chi^2_2 = 14.31^*$

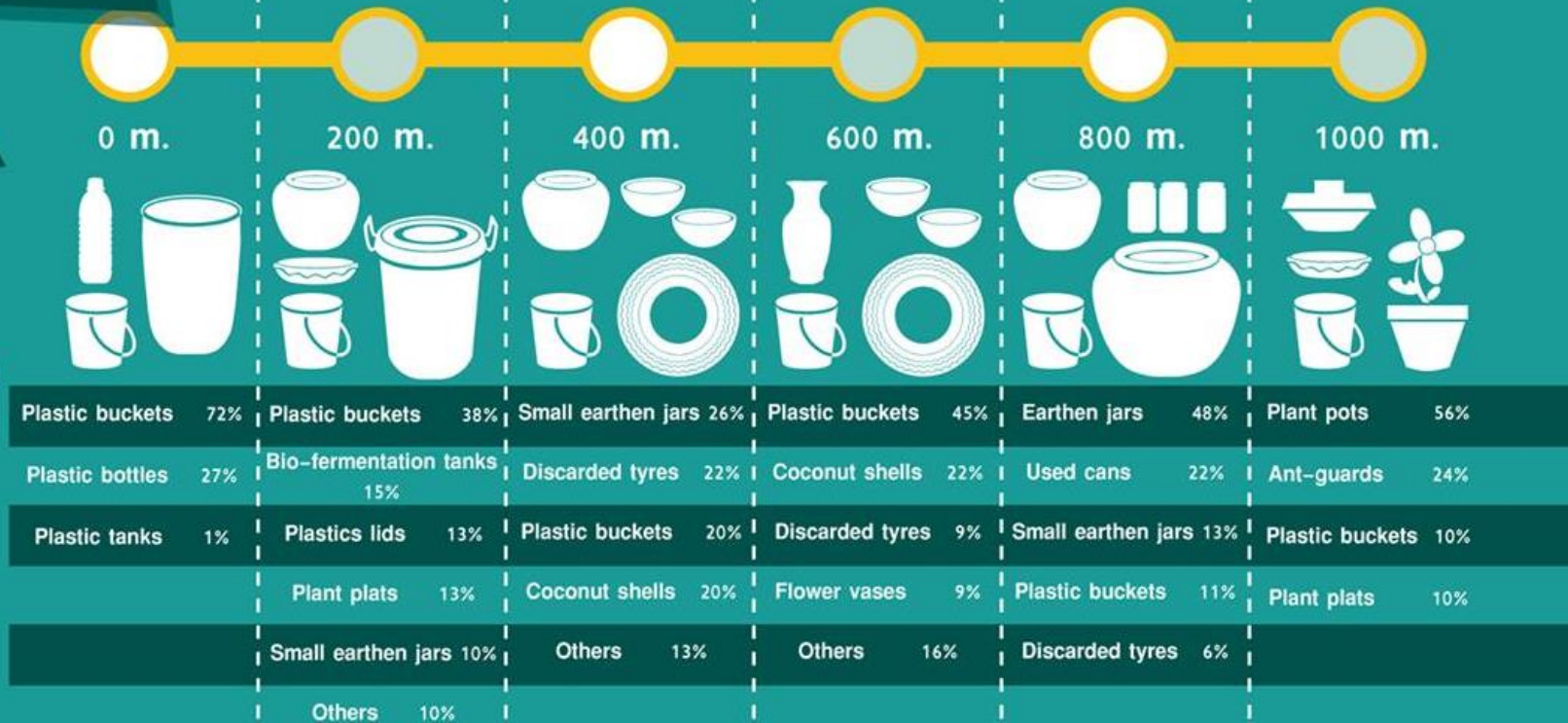
$\chi^2_1 = 199.17^*$

$\chi^2_2 = 161.90^*$

$\chi^2_2 = 17.43^*$

$\chi^2_2 = 14.31^*$

Containers



Most mosquito larvae were found in plastic bucket. At 400 m. the abundance of mosquito larvae were found in many water containers. At 800 m. most of mosquito larvae were found in earthen jars and 1000 m. most of mosquito larvae were found in plant pots.

Mosquito larvae species and abundance in indoor and outdoor breeding sites (* $P < 0.05$)

Breeding sites		<i>Ae. aegypti</i>	<i>Ae. albopictus</i>	<i>Culex</i> spp.
Hotels	Indoor containers	1	0	0
	Outdoor containers	17	272	80
Houses	Indoor containers	2	42	4
	Outdoor containers	43	150	133
Ratio Indoor : Outdoor		3 : 60	42 : 422	4 : 213
Statistical test		$\chi^2 = 51.571^*$	$\chi^2 = 311.027^*$	$\chi^2 = 201.295^* [8]$

Conclusions

- **Tourism affecting dengue outbreak by increasing mosquito breeding sites.**
 - 1. Increase trashes at tourist attraction sites.**
 - 2. Food preparation e.g. coconut shells**
 - 3. Hotel decors e.g. flower pots and earthen jars filled with water and water lilies.**

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