

A Study of Larval Indices (HI, CI, and BI) and Types of Breeding Containers in the Community

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Abstract

This study aimed to investigate dengue mosquito larval indices, including the House Index (HI), Container Index (CI), and Breteau Index (BI), as well as to examine the types of containers that serve as breeding sites for dengue mosquito larvae in the community. The objective was to assess the level of risk for mosquito-borne diseases, such as dengue fever. The study was conducted through a field survey by inspecting water-holding containers in households and surrounding areas. Data were collected on the number of houses where larvae were found, the number of containers inspected, and the types of containers that served as breeding sites.

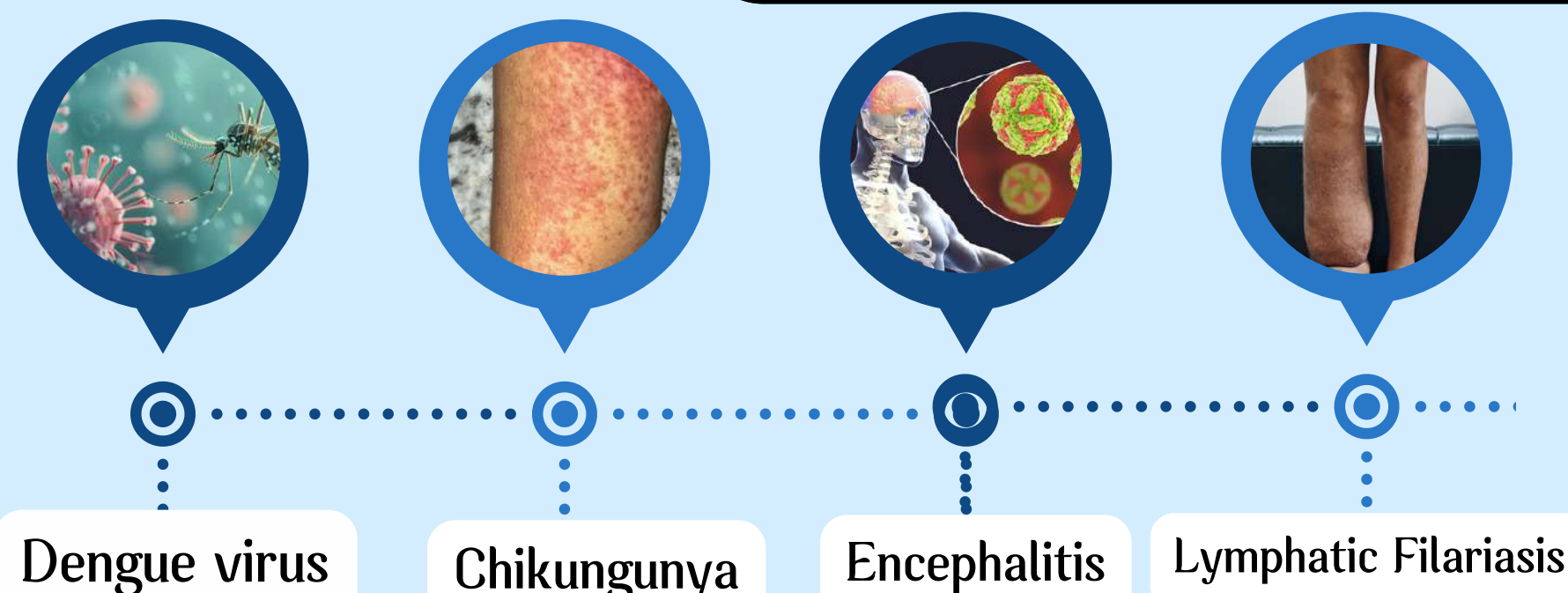
The results showed that the larval indices (HI, CI, and BI) were at levels indicating a risk of disease transmission. The containers most frequently found to contain mosquito larvae included water storage containers, uncovered containers, and unused discarded items such as cans and old tires. The findings highlight the importance of environmental management and the elimination of mosquito breeding sites within the community. Public participation should be promoted to ensure regular maintenance of water-holding containers in order to reduce mosquito larval populations and sustainably prevent dengue fever outbreaks in the community.

Research Question and Hypothesis

Research Question What are the levels of dengue mosquito larval indices (HI, CI, and BI), and which types of containers serve as the major breeding sites in Ban Nong Lung community?

Research Hypotheses Uncovered or poorly maintained water-holding containers are more likely to contain dengue mosquito larvae than properly managed containers

Introduction



Dengue fever is a major public health issue in Thailand, spread by Aedes mosquitoes breeding in water-holding containers. Monitoring larvae through indices—House Index (HI), Container Index (CI), and Breteau Index (BI)—helps assess outbreak risk and guide prevention. Studying these indices and container types reveals key breeding sites, supports environmental management, and promotes community participation, ultimately reducing dengue risk and improving sustainable health.

Materials

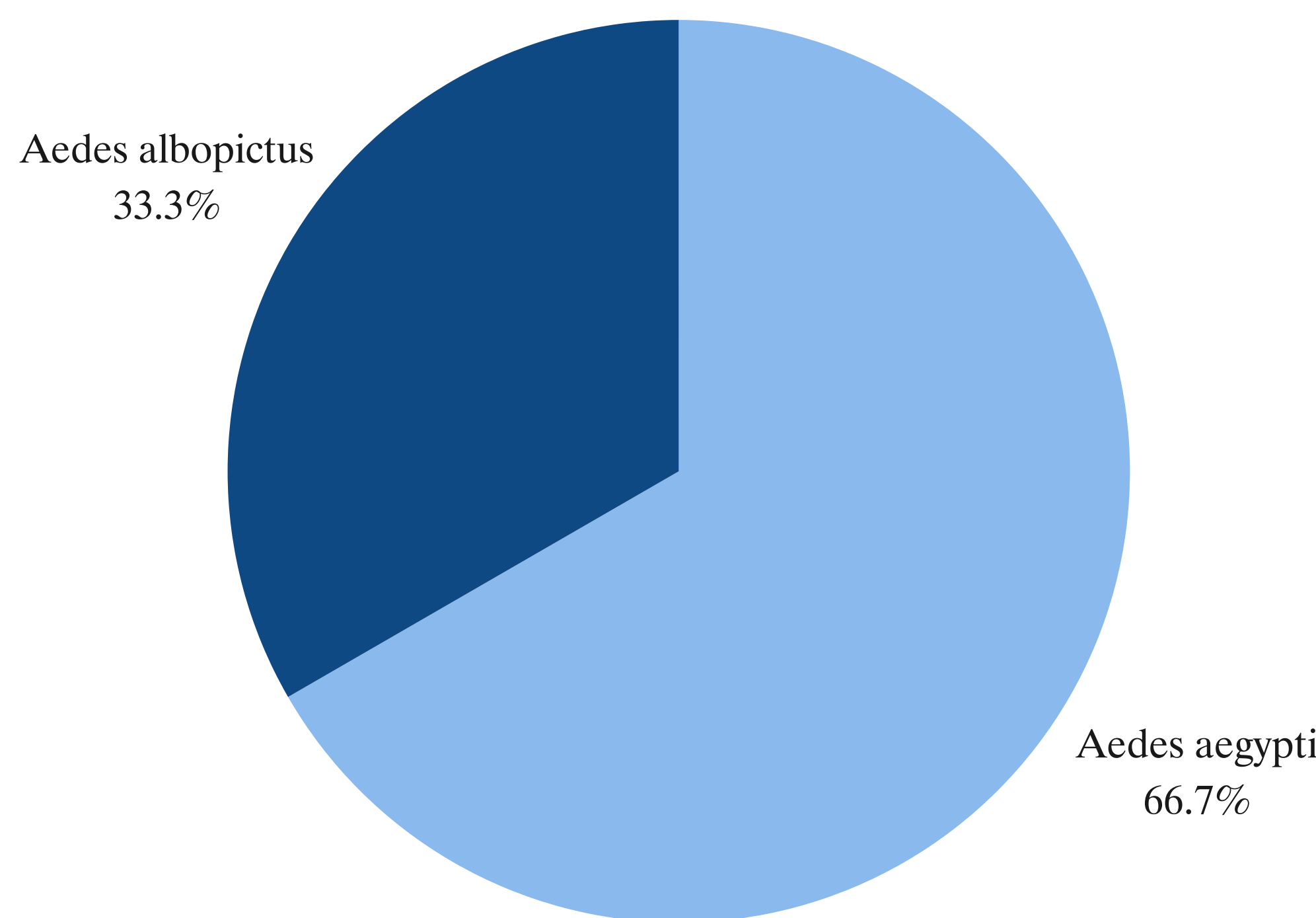


Research Methods

- 1. Field Survey**
The study area was defined in Ban Nong Lung community, Phak Mai Subdistrict, Huai Thap Than District, Sisaket Province, to serve as the boundary for data collection.
- 2. Inspection of Aedes Larvae**
Households were surveyed to examine the presence of Aedes larvae in various water-holding containers. The types of containers in which larvae were found were recorded.
- 3. Identification of Aedes Species from Larvae**
Larvae were identified based on preliminary morphological characteristics such as body shape, structure, and movement, in order to determine the species of Aedes mosquitoes present in the study area.
 - Aedes albopictus (forest mosquito)
 - Aedes aegypti (domestic mosquito)
- 4. Measurement of Water pH**
The pH of water in containers containing Aedes larvae was measured using a pH meter, and the values obtained were recorded.
- 5. Data Recording and Analysis**
Data collected from the survey were recorded and used to calculate larval indices, including the House Index (HI), Container Index (CI), and Breteau Index (BI). The results were then analyzed to summarize the findings of the research.
- 6. Report data**
All collected environmental and soil data were uploaded to the GLOBE Program database via the Data Entry system at <https://www.globe.gov>.

Results

Species diversity of mosquitoes in villages



In the village area, Aedes albopictus was the most prevalent species at 56.0%. This proportion is significantly higher than that of Aedes aegypti, which accounted for only 13.7%. The results indicate that Aedes albopictus has a strong preference for breeding in artificial containers within the village environment.

Table 1 The quantity and consumption of mosquito larvae surveyed in the Nong Lung village area.

Container Type	Total number	Larvae Found	Percentage (%)
Container Type	24	15	62.5
Container Type	29	11	37.93
Container Type	83	27	32.53
Container Type	12	4	33.33
Container Type	29	15	51.72

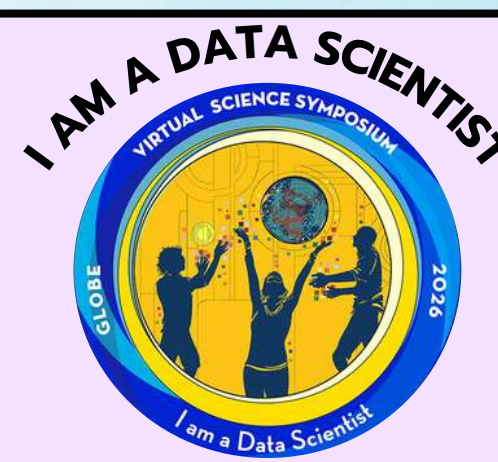
Discussion

This study examined Aedes larvae prevalence and weather factors in Phak Mai Subdistrict, Sisaket, from June to August 2025. HI, CI, and BI values exceeded safety standards, indicating a high dengue transmission risk associated with heavy rainfall and humidity. Larvae were most commonly found in uncovered and poorly maintained containers. Proper water container management significantly reduced larval indices, highlighting the importance of household-level breeding site control and community participation for effective dengue surveillance and prevention.

Bibliography

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Badges



This research demonstrates a data scientist role by systematically collecting field data on houses and larvae-infested containers. It calculates HI, CI, and BI indices, uses statistical percentage analysis, and presents data through tables to accurately conclude the mosquito outbreak situation in the community.



This research creates a direct impact on public health in Ban Nong Lung. By identifying key breeding sites for dengue-carrying mosquitoes, the data is used for disease surveillance and control planning, effectively reducing health risks and promoting sustainable household environmental management.



This reflects collaboration between the research team and advisors working directly with community members. It involves knowledge exchange and follows the GLOBE scientific process, aiming for a shared goal: solving local epidemic problems through collective action.