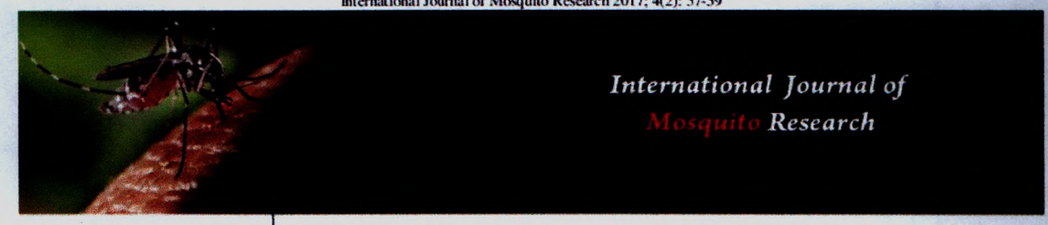
Analysis of indicators entomology Aedes aegyptiin endemic areas of dengue fever in Padang, West sumatra, Indonesia

by Eka Novita1

Submission date: 17-Dec-2020 11:00AM (UTC+0800)
Submission ID: 1477315342
File name: mic_areas_of_dengue_fever_in_Padang,_West_sumatra,_Indonesia.pdf (508.38K)
Word count: 2411
Character count: 12120

International Journal of Mosquito Research 2017; 4(2): 57-59



ISSN: 2348-5906
CODEN: IJMRK2
IJMR 2017; 4(2): 57-59

Received: 10-01-2017
Accepted: 11-02-2017

Eka Nofita
Subdivision of Parasitology, Faculty of Medicine, Andalas University, Padang, West Sumatra, Indonesia

Hasmiwati
Subdivision of Parasitology, Faculty of Medicine, Andalas University, Padang, West Sumatra, Indonesia

Selfi Renita Rusdji
Subdivision of Parasitology, Faculty of Medicine, Andalas University, Padang, West Sumatra, Indonesia

Nuzulia Irawati
Subdivision of Parasitology, Faculty of Medicine, Andalas University, Padang, West Sumatra, Indonesia

Correspondence
Hasmiwati
Subdivision of Parasitology, Faculty of Medicine, Andalas University, Padang, West Sumatra, Indonesia

Analysis of indicators entomology *Aedes aegypti* in endemic areas of dengue fever in Padang, West sumatra, Indonesia

Eka Nofita, Hasmiwati, Selfi Renita Rusdji and Nuzulia Irawati

Abstract
Dengue hemorrhagic fever (DHF) is a major public health problem in Indonesia. The main dengue control is the cutting of transmission chain by controlling the vector. The vector observation of *Aedes aegypti* is important to know regarding to spread, density, main habitat and risk transmission of larvae. We conducted the study of the analysis of indicators of entomology *Ae. aegypti* in endemic areas of dengue fever in Padang, West Sumatra, Indonesia from July to December 2016. This study aimed to determine the density of larvae analysis and Maya Index (House Index / HI, Breteau Index / BI, Container Index / CI) and Maya Index / MI in Padang. Some 100 houses in every village were used as the sample survey of larvae in accordance with WHO. Larva of *Ae. aegypti* was observed by visual and single larva method. Totally, a hundred houses surveyed in six districts were founded HI 9% - 49%, BI 9% - 102%, CI 1.2% - 26.1% DF 2- 6, MI all villages surveyed low- being, as a result, it can be concluded that the density of *Ae. aegypti* larvae in Padang was medium-high and medium-low Maya Index.

Keywords: Dengue, *Aedes aegypti*, larvae, Bretau index, Container index, Maya index

1. Introduction
Dengue hemorrhagic fever (DHF) is a major public health problem in Indonesia. Padang is one of the endemic areas in West Sumatra. Various efforts have been made in the prevention of dengue fever, including the detection and treatment of patients, vector control, and cooperation across sector [7]. Major dengue control is to break the chain of transmission control vector, because, until now, the vaccine and cure are still not available [8]. Activity control vector has been conducted by using fumigation, pouring larvacide and eradication of mosquito's nest, but these are still less than optimal. Vector observation of *Ae. aegypti* is especially important to determine the spread, the density, the main habitat of larvae, the possibility of infection risk, the sensitivity of mosquitoes to insecticides and prioritize locations and timing of vector eradication. Existing of *Ae. aegypti* larvae in this area is an indicator that there are population of larvae in that specific area [11-13].

Data on dengue vector population in each region, such as the Container Index (CI), House Index (HI), Breteau Index (BI), and ovitrap Index (OI), became an indispensable parameter entomologist. In the context of prevention of dengue fever, there are also needed in terms of environmental data associated with dengue vector mosquito bionomics, namely Maya Index (MI) [14]. Maya Index (MI) is a new indicator that describes whether a high-risk area or community become breeding places of *Ae. Aegypti*, based on the status of cleanliness of the area and the availability of potential sites for an advanced breeding places of mosquitoes. Therefore, it is important to know about density analysis of larva *Ae. aegypti* in Padang. This will give us information about the spread, density, the main habitat of larvae and the possibility of risk infection in Padang.

2. Material and Methods
This research was conducted in six locations in the city of Padang such as Balai Gadang, Korong gadang, jati, bandar buek, gunung pangilun and limau manis. The geographical of location is 0° 44' 00" and 1° 08' 35" South latitude then from 100° 05' 05" and 100° 34' 09" East longitude.

The altitudes of the location range are from 1000–1853 m above sea level. Mosquito larva sample was conducted from July to December 2016. Data were obtained by the survey in 100 houses in every district. Existing larvae was observed with single larva method. Sampling was done by purposive sampling. Larvae was collected and reared under laboratory conditions. The larvae was identified under microscope condition with a magnification 4x objective. Then, the larvae was identified with the aid of published identification keys [16, 17]

Index dengue vector mosquito larvae is expressed in three types of indexes; House Index (HI), Container Index (CI), and the Breteau Index (BI). Larvae density (density figure) is calculated based on the value of HI, while CI and BI were categorized into low-density, medium and high using the criteria of the Queensland Government (2011) [15]. Maya index (MI) is identified by looking at the water reservoirs (TPA), at the house, which are grouped into disposable sites, contrable sites and under-controlled sites.

3. Results

Based on our survey at 100 houses in four districts in Padang, west Sumatra, Indonesia. Here are the results of the analysis of survey data larvae in each village. House index (HI) described the distribution of mosquito in current region. According to Word Health Organization, an area is mentioned to be at high risk for the spread of dengue if it has HI> 10%, and low risk when HI <1% [15]. Table 1 showed that the highest HI was in Korong gadang (49%) and the lowest was in Limau Manis (9%). Container index (CI) illustrates the number of water reservoirs containing larvae. Table 2 showed the highest CI was in Bandar buat (26.1%), and lowest was in Limau Manis (1.5%). From table 2 above, it also showed that the four villages discount WHO, CI values above provisions, namely Bandar buat (26.1%), Korong gadang (13.17%), Gunung Pangilun (10.38%) and Jati (5.95%).

The highest BI Korong Tower (102%), and the lowest in Limau Manis (9%) (see table 3). Table 4 the village with the highest DF Korong gadang and the lowest in Limau Manis. When, it referred to the WHO criteria, it all the villages studied had moderate-risk of contracting high dengue. Table 5 that the results of this research MI at low-medium in Korong gadang and Jati a moderate MI, which means that this area has a medium risk for mosquito breeding places. Wiggler type was known by identifying larva in subdivision of Parasitology, Faculty of Medicine, Andalas University, Padang, West Sumatra, Indonesia.

Table 1: The result of survey *House index Ae. Aegypti* in Padang

Disrict	Σ rumah was inspected	Σ rumah + larvae	HI (%)
Balai Gadang	100	17	17
Korong Gadang	100	49	49
Gunung Pangilun	100	29	29
Limau Manis	100	9	9
Jati	100	35	35
Bandar Buat	100	26	26

Table 2: The result of survey *Container index Ae. Aegypti* in Padang

District	Σ container was inspected	Σ container + larva	CI (%)
Balai Gadang	480	20	4,2
Korong Gadang	774	102	13,17
Gunung Pangilun	472	49	10,38
Limau Manis	602	9	1,5
Jati	924	55	5,95
Bandar Buat	138	36	26,1

Table 3: The result of survey *Breteau index (BI) Ae. Aegypti* in Padang

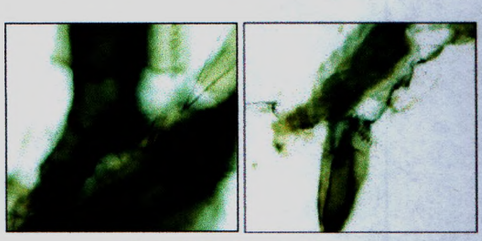
District	Σ house was inspected	Σ container was inspected	Σ container + larvae	BI (%)
Balai Gadang	100	480	20	20
Korong Gadang	100	774	102	102
Gunung Pangilun	100	472	49	49
Limau manis	100	602	9	9
Jati	100	924	55	55
Bandar Buat	100	138	36	36

Table 4: *Density figure (DF) Ae. Aegypti* in Padang

District	HI	CI	BI	DF
Balai Gadang	17	4.2	20	3
Korong Gadang	49	13,17	102	6
Gunung Pangilun	29	10,38	49	5
Limau Manis	9	1.5	9	2
Jati	35	5,95	55	5
Bandar Buat	26	26,1	36	5

Table 5: *Maya index Ae. Aegypti* di Kota Padang

District	BRI	HRI	MI
Balai Gadang	5,06	0,51	Low
Korong Gadang	15,07	2,6	Moderate
Gunung Pangilun	4,55	0,59	Low
Limau Manis	1,1	1,65	Low
Jati	123,48	0,65	Moderate
Bandar Buat	0,625	0,3	Low



Picture 1: Identification of larvae

4. Discussion

House index (HI) describes the distribution of mosquito in a region. According to WHO, an area is mentioned to be at high risk for the spread of dengue if it has HI> 10%, and low risk

when HI <1%. It was seen that almost all villages have HI> 10%, which means that these villages are at high risk for dengue transmission. Only Limau Manis had HI <10% (9%). This illustrates that there are still many positive home and the high spread of mosquito larvae in research areas that result in the magnitude of the risk of contracting dengue. Limau Manis has a medium risk for dengue transmission.

Based on data from incidence of dengue in the city of Padang in 2015, obtained from the City Health Office Padang, it can be seen from the six villages studied that the highest dengue cases was found in Balai gadang (Cold Water) and Korong gadang, while the lowest was in Limau Manis. This is in line with figures obtained HI, which is the highest in Korong gadang and the lowest in Limau Manis. [16]

Container index (CI) illustrates the number of water reservoirs containing larvae. The higher the number the CI in a region increasingly available show a reservoir of water containing larvae, resulting in higher risk of occurrence and spread of dengue. Based on the CI indicator results, this study showed that the Bandar buat was the highest areas that have risk of dengue transmission, and Limau Manis with the lowest risk. The standards set by WHO for the value of CI is <5% [15] These results are consistent with the data incidence of dengue in the city of Padang in 2015, from six villages studied this, Limau Manis has the lowest incidence of dengue.

According to the WHO, criteria for a region of dengue fever is safe if it has a value of BI ≤ 2, BI = 5-20 including low risk, BI = 20-35 including intermediate risk, while BI = 35-50 including the risk tinggi [15]. If it refers to the WHO criteria that there is no area that is safe from dengue fever. All the villages are areas at risk for dengue transmission occurs, with details as follows Korong gadang, Jati, Gunung Pangilun and Bandar buat an area with a high risk of transmission of dengue, Balai gadang has a medium risk for dengue transmission and Limau Manis low risk for transmission of dengue.

Density figure (DF) is the density of *Ae. aegypti* larvae which is a combination of HI, CI and BI. DF is determined after calculate the results HI, CI, then BI is compared with larvae table Index. DF is expressed with a scale of 1-9, in which DF figure of is less than one indicate a low risk of transmission, while the risk of transmission was 1-5 and over 5 is high transmission risk [15]. As it referred to WHO criteria in table 4 showed that all villages surveyed had a risk of dengue transmission medium to high.

Maya Index (MI) is an indicator to determine whether a high-risk areas as breeding places of mosquitoes. It knows of the kinds and amount of mosquito breeding sites, which are divided into a place that can be controlled (controlable sites), garbage (disposable sites) and the place was always controlled (undercontrolable sites). Then determined Hygiene Risk Incidence (HRI) and Breeding Risk Incidence (BRI). HRI describe the cleanliness of the house, and BRI, posing the risk larval breeding sites. Overview BRI, HRI and MI in the village of Padang (see table 5).

5. Conclusion

Based on larval density indicators, it can be obtained that all the villages studied had moderate-high risk for dengue transmission. The area with the highest risk is Korong gadang, and the lowest is Limau Manis. Maya Indicators Index (MI) that shows all the villages studied had moderate-low risk for mosquito breeding places.

6. Acknowledgment

This research was made possible through funding from PNBP funds of Faculty of Medicine, Andalas University.

7. References

1. Ministry of Health. Dengue hemorrhagic fever. Window Epidemiology Bulletin. 2010; 2: 2-4.
2. Achmadi UF. Dengue-based management area. Window Epidemiology Bulletin. 2010; 2: 15-20.
3. Widyastuti P. Complete guide prevention and control of dengue, EGC, Jakarta, 2007
4. MOH, Behavior and life cycle of the mosquito *Aedes aegypti* is very important to know in conducting mosquito eradication, DG P2M, Jakarta, 2004, 47-53.
5. The West Sumatra Provincial Health Office. Data dengue cases of West Sumatra province Padang Year 2015; 2015.
6. Health Agency of Padang. Number of Cases of Dengue Fever Year 2015 Padang; 2015.
7. Sunaryo, Pramestuti N. *Aedes aegypti* surveillance in endemic areas of dengue fever. Journal of the National Public Health. 2014; 8 (8): 423-9.
8. Sragen S. Problems vector of dengue hemorrhagic fever (DHF) and its control in Indonesia. Window Epidemiology Bulletin. 2010; 2: 26-30.
9. Purnama SG, Baskoro T. Maya Index and density of *Aedes aegypti* larvae of the dengue infection. Makara Health. 2012; 16 (2): 57-64.
10. Hoedojo, Zulhasril, Vector control chit Sutanto I, Ismid IS, Syarifuddin, Sungkar S (editors), Medical Parasitology, FKUI, Jakarta, 2008.
11. Boesri H, Boewono DT. *Aedes aegypti* situation and its control in endemic areas of dengue fever in the city of Salatiga. Media Health Research and Development. 2008; 18 (2): 78-82.
12. Erlanger TE, Keiser J, Utzinger J. Effect of dengue vector control interventions on Entomological parameters in developing countries: a systemic review and meta-analysis. Medical and veterinary Entomology. 2008; 22: 203-21.
13. 13.Banu S, Hu W, C Hurst, and Tong S. dengue transmission in the Asia-Pacific region: the impact of climate change and socio-environmental factors. Tropical Medicine and International Health. 2011; 16 (5): 598-607.
14. 14.Wati NAP, Survey entomologi and virtual determination index in endemic areas of dengue in the hamlet Krapyak Kulon, Panggungharjo Village, District of Sewon, Bantul, Yogyakarta, Respati Medical Journal, 2015,10 (3): 76-84.
15. 15.Word Health Organization, A review of entomological sampling methods and indicators for dengue vectors, WHO, 2003
16. 16. Sembel D, Medical Entomology, CV Andi Office, Yogyakarta, 2009.
17. 17. Djakaria S, Sungkar S. Vector viral disease, rickets, spirochaetes and bacteria chit Sutanto I, Ismid IS, Syarifuddin, Sungkar S (editors), Medical Parasitology, FKUI, Jakarta,2008.

Analysis of indicators entomology Aedes aegyptiin endemic areas of dengue fever in Padang, West sumatra, Indonesia

ORIGINALITY REPORT

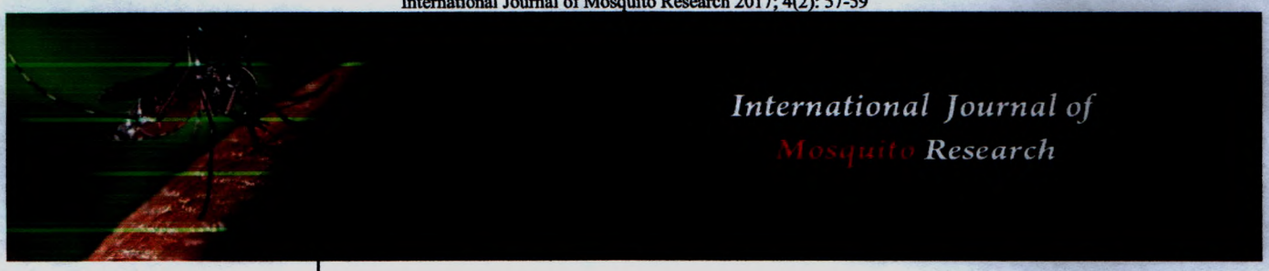
7%	8%	6%	5%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	pingpdf.com Internet Source	2%
2	bmcresnotes.biomedcentral.com Internet Source	2%
3	scholar.unand.ac.id Internet Source	2%
4	Submitted to Universiti Teknologi MARA Student Paper	2%

Exclude quotes	On	Exclude matches	< 2%
Exclude bibliography	Off		

International Journal of Mosquito Research 2017; 4(2): 57-59



ISSN: 2348-5906
CODEN: IJMRK2
IJMR 2017; 4(2): 57-59

Received: 10-01-2017
Accepted: 11-02-2017

Eka Nofita
Subdivision of Parasitology, Faculty of Medicine, Andalas University, Padang, West Sumatra, Indonesia

Hasmiwati
Subdivision of Parasitology, Faculty of Medicine, Andalas University, Padang, West Sumatra, Indonesia

Selfi Renita Rusdji
Subdivision of Parasitology, Faculty of Medicine, Andalas University, Padang, West Sumatra, Indonesia

Nuzulia Irawati
Subdivision of Parasitology, Faculty of Medicine, Andalas University, Padang, West Sumatra, Indonesia

Correspondence
Hasmiwati
Subdivision of Parasitology, Faculty of Medicine, Andalas University, Padang, West Sumatra, Indonesia

Analysis of indicators entomology *Aedes aegypti* in endemic areas of dengue fever in Padang, West sumatra, Indonesia

Eka Nofita, Hasmiwati, Selfi Renita Rusdji and Nuzulia Irawati

Abstract
Dengue hemorrhagic fever (DHF) is a major public health problem in Indonesia. The main dengue control is the cutting of transmission chain by controlling the vector. The vector observation of *Aedes aegypti* is important to know regardling to spread, density, main habitat and risk transmission of larvae. We conducted the study of the analysis of indicators of entomology *Ae. aegypti* in endemic areas of dengue fever in Padang, West Sumatra, Indonesia from July to December 2016. This study aimed to determine the density of larvae analysis and Maya Index (House Index / HI, Breteau Index / BI, Container Index / CI) and Maya Index / MI in Padang. Some 100 houses in every village were used as the sample survey of larvae in accordance with WHO. Larva of *Ae. aegypti* was observed by visual and single larva method. Totally, a hundred houses surveyed in six districts were founded HI 9% - 49%, BI 9% - 102%, CI 1.2% - 26.1% DF 2- 6, MI all villages surveyed low- being, as a result, it can be concluded that the density of *Ae. aegypti* larvae in Padang was medium-high and medium-low Maya Index.

Keywords: Dengue, *Aedes aegypti,* larvae, Bretau index, Container index, Maya index

1. Introduction
Dengue hemorrhagic fever (DHF) is a major public health problem in Indonesia. Padang is one of the endemic areas in West Sumatra. Various efforts have been made in the prevention of dengue fever, including the detection and treatment of patients, vector control, and cooperation across sector [7]. Major dengue control is to break the chain of transmission control vector, because, until now, the vaccine and cure are still not available [8]. Activity control vector has been conducted by using fumigation, pouring larvacide and eradication of mosquito's nest, but these are still less than optimal. Vector observation of *Ae. aegypti* is especially important to determine the spread, the density, the main habitat of larvae, the possibility of infection risk, the sensitivity of mosquitoes to insecticides and prioritize locations and timing of vector eradication. Existing of *Ae. aegypti* larvae in this area is an indicator that there are population of larvae in that specific area [11-13].
Data on dengue vector population in each region, such as the Container Index (CI), House Index (HI), Breteau Index (BI), and ovitrap Index (OI), became an indispensable parameter entomologist. In the context of prevention of dengue fever, there are also needed in terms of environmental data associated with dengue vector mosquito bionomics, namely Maya Index (MI) [14]. Maya Index (MI) is a new indicator that describes whether a high-risk area or community become breeding places of *Ae. Aegypti*, based on the status of cleanliness of the area and the availability of potential sites for an advanced breeding places of mosquitoes. Therefore, it is important to know about density analysis of larva *Ae. aegypti* in Padang. This will give us information about the spread, density, the main habitat of larvae and the possibility of risk infection in Padang.

2. Material and Methods
This research was conducted in six locations in the city of Padang such as Balai Gadang, Korong gadang, jati, bandar buek, gunung pangilun and limau manis. The geographical of location is 0° 44' 00" and 1° 08' 35" South latitude then from 100° 05' 05" and 100° 34' 09" East longitude.

The altitudes of the location range are from 1000–1853 m above sea level. Mosquito larva sample was conducted from July to December 2016. Data were obtained by the survey in 100 houses in every district. Existing larvae was observed with single larva method. Sampling was done by purposive sampling. Larvae was collected and reared under laboratory conditions. The larvae was identified under microscope condition with a magnification 4x objective. Then, the larvae was identified with the aid of published identification keys [16, 17]

Index dengue vector mosquito larvae is expressed in three types of indexes; House Index (HI), Container Index (CI), and the Breteau Index (BI). Larvae density (density figure) is calculated based on the value of HI, while CI and BI were categorized into low-density, medium and high using the criteria of the Queensland Government (2011) [15]. Maya index (MI) is identified by looking at the water reservoirs (TPA), at the house, which are grouped into disposable sites, contrable sites and under-controlled sites.

3. Results

Based on our survey at 100 houses in four districts in Padang, west Sumatra, Indonesia. Here are the results of the analysis of survey data larvae in each village. House index (HI) described the distribution of mosquito in current region. According to Word Health Organization, an area is mentioned to be at high risk for the spread of dengue if it has HI> 10%, and low risk when HI <1% [15]. Table 1 showed that the highest HI was in Korong gadang (49%) and the lowest was in Limau Manis (9%). Container index (CI) illustrates the number of water reservoirs containing larvae. Table 2 showed the highest CI was in Bandar buat (26.1%), and lowest was in Limau Manis (1.5%). From table 2 above, it also showed that the four villages discount WHO, CI values above provisions, namely Bandar buat (26.1%), Korong gadang (13.17%), Gunung Pangilun (10.38%) and Jati (5.95%).

The highest BI Korong Tower (102%), and the lowest in Limau Manis (9%) (see table 3). Table 4 the village with the highest DF Korong gadang and the lowest in Limau Manis. When, it referred to the WHO criteria, it all the villages studied had moderate-risk of contracting high dengue. Table 5 that the results of this research MI at low-medium in Korong gadang and Jati a moderate MI, which means that this area has a medium risk for mosquito breeding places. Wiggler type was known by identifying larva in subdivision of Parasitology, Faculty of Medicine, Andalas University, Padang, West Sumatra, Indonesia.

Table 1: The result of survey *House index Ae. Aegypti* in Padang

Disrict	Σ rumah was inspected	Σ rumah + larvae	HI (%)
Balai Gadang	100	17	17
Korong Gadang	100	49	49
Gunung Pangilun	100	29	29
Limau Manis	100	9	9
Jati	100	35	35
Bandar Buat	100	26	26

Table 2: The result of survey *Container index Ae. Aegypti* in Padang

District	Σ container was inspected	Σ container + larva	CI (%)
Balai Gadang	480	20	4,2
Korong Gadang	774	102	13,17
Gunung Pangilun	472	49	10,38
Limau Manis	602	9	1,5
Jati	924	55	5,95
Bandar Buat	138	36	26,1

Table 3: The result of survey *Breteau index (BI) Ae. Aegypti* in Padang

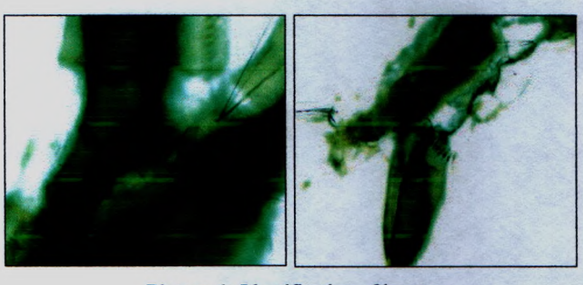
District	Σ house was inspected	Σ container was inspected	Σ container + larvae	BI (%)
Balai Gadang	100	480	20	20
Korong Gadang	100	774	102	102
Gunung Pangilun	100	472	49	49
Limau manis	100	602	9	9
Jati	100	924	55	55
Bandar Buat	100	138	36	36

Table 4: *Density figure (DF) Ae. Aegypti* in Padang

District	HI	CI	BI	DF
Balai Gadang	17	4.2	20	3
Korong Gadang	49	13.17	102	6
Gunung Pangilun	29	10,38	49	5
Limau Manis	9	1.5	9	2
Jati	35	5,95	55	5
Bandar Buat	26	26,1	36	5

Table 5: *Maya index Ae. Aegypti* di Kota Padang

District	BRI	HRI	MI
Balai Gadang	5.06	0.51	Low
Korong Gadang	15.07	2.6	Moderate
Gunung Pangilun	4,55	0,59	Low
Limau Manis	1,1	1,65	Low
Jati	123,48	0,65	Moderate
Bandar Buat	0,625	0,3	Low



Picture 1: Identification of larvae

4. Discussion

House index (HI) describes the distribution of mosquito in a region. According to WHO, an area is mentioned to be at high risk for the spread of dengue if it has HI> 10%, and low risk

when HI <1%. It was seen that almost all villages have HI> 10%, which means that these villages are at high risk for dengue transmission. Only Limau Manis had HI <10% (9%). This illustrates that there are still many positive home and the high spread of mosquito larvae in research areas that result in the magnitude of the risk of contracting dengue. Limau Manis has a medium risk for dengue transmission.

Based on data from incidence of dengue in the city of Padang in 2015, obtained from the City Health Office Padang, it can be seen from the six villages studied that the highest dengue cases was found in Balai gadang (Cold Water) and Korong gadang, while the lowest was in Limau Manis. This is in line with figures obtained HI, which is the highest in Korong gadang and the lowest in Limau Manis. [6]

Container index (CI) illustrates the number of water reservoirs containing larvae. The higher the number the CI in a region increasingly available show a reservoir of water containing larvae, resulting in higher risk of occurrence and spread of dengue. Based on the CI indicator results, this study showed that the Bandar buat was the highest areas that have risk of dengue transmission, and Limau Manis with the lowest risk. The standards set by WHO for the value of CI is <5% [15] These results are consistent with the data incidence of dengue in the city of Padang in 2015, from six villages studied this, Limau Manis has the lowest incidence of dengue.

According to the WHO, criteria for a region of dengue fever is safe if it has a value of BI ≤ 2, BI = 5-20 including low risk, BI = 20-35 including intermediate risk, while BI = 35-50 including the risk tinggi [15]. If it refers to the WHO criteria that there is no area that is safe from dengue fever. All the villages are areas at risk for dengue transmission occurs, with details as follows Korong gadang, Jati, Gunung Pangilun and Bandar buat an area with a high risk of transmission of dengue, Balai gadang has a medium risk for dengue transmission and Limau Manis low risk for transmission of dengue.

Density figure (DF) is the density of *Ae. aegypti* larvae which is a combination of HI, CI and BI. DF is determined after calculate the results HI, CI, then BI is compared with larvae table Index. DF is expressed with a scale of 1-9, in which DF figure of is less than one indicate a low risk of transmission, while the risk of transmission was 1-5 and over 5 is high transmission risk [15]. As it referred to WHO criteria in table 4 showed that all villages surveyed had a risk of dengue transmission medium to high.

Maya Index (MI) is an indicator to determine whether a high-risk areas as breeding places of mosquitoes. It knows of the kinds and amount of mosquito breeding sites, which are divided into a place that can be controlled (controlable sites), garbage (disposable sites) and the place was always controlled (undercontrolable sites). Then determined Hygiene Risk Incidence (HRI) and Breeding Risk Incidence (BRI). HRI describe the cleanliness of the house, and BRI, posing the risk larval breeding sites. Overview BRI, HRI and MI in the village of Padang (see table 5).

5. Conclusion

Based on larval density indicators, it can be obtained that all the villages studied had moderate-high risk for dengue transmission. The area with the highest risk is Korong gadang, and the lowest is Limau Manis. Maya Indicators Index (MI) that shows all the villages studied had moderate-low risk for mosquito breeding places.

6. Acknowledgment

This research was made possible through funding from PNBP funds of Faculty of Medicine, Andalas University.

7. References

1. Ministry of Health. Dengue hemorrhagic fever. Window Epidemiology Bulletin. 2010; 2: 2-4.
2. Achmadi UF. Dengue-based management area. Window Epidemiology Bulletin. 2010; 2: 15-20.
3. Widyastuti P, Complete guide prevention and control of dengue, EGC, Jakarta, 2007
4. MOH, Behavior and life cycle of the mosquito *Aedes aegypti* is very important to know in conducting mosquito eradication, DG P2M, Jakarta, 2004, 47-53.
5. The West Sumatra Provincial Health Office. Data dengue cases of West Sumatra province Padang Year 2015; 2015.
6. Health Agency of Padang. Number of Cases of Dengue Fever Year 2015 Padang; 2015.
7. Sunaryo, Pramestuti N. *Aedes aegypti* surveillance in endemic areas of dengue fever. Journal of the National Public Health. 2014; 8 (8): 423-9.
8. Sragen S. Problems vector of dengue hemorrhagic fever (DHF) and its control in Indonesia. Window Epidemiology Bulletin. 2010; 2: 26-30.
9. Purnama SG, Baskoro T. Maya Index and density of *Aedes aegypti* larvae of the dengue infection. Makara Health. 2012; 16 (2): 57-64.
10. Hoedojo, Zulhasril, Vector control chit Sutanto I, Ismid IS, Syarifuddin, Sungkar S (editors), Medical Parasitology, FKUI, Jakarta, 2008.
11. Boesri H, Boewono DT. *Aedes aegypti* situation and its control in endemic areas of dengue fever in the city of Salatiga. Media Health Research and Development. 2008; 18 (2): 78-82.
12. Erlanger TE, Keiser J, Utzinger J. Effect of dengue vector control interventions on Entomological parameters in developing countries: a systemic review and meta-analysis. Medical and veterinary Entomology. 2008; 22: 203-21.
13. 13.Banu S, Hu W, C Hurst, and Tong S. dengue transmission in the Asia-Pacific region: the impact of climate change and socio-environmental factors. Tropical Medicine and International Health. 2011; 16 (5): 598-607.
14. 14.Wati NAP, Survey entomologi and virtual determination index in endemic areas of dengue in the hamlet Krapyak Kulon, Panggungharjo Village, District of Sewon, Bantul, Yogyakarta, Respati Medical Journal, 2015,10 (3): 76-84.
15. 15.Word Health Organization, A review of entomological sampling methods and indicators for dengue vectors, WHO, 2003
16. 16. Sembel D, Medical Entomology, CV Andi Office, Yogyakarta, 2009.
17. 17. Djakaria S, Sungkar S. Vector viral disease, rickets, spirochaetes and bacteria chit Sutanto I, Ismid IS, Syarifuddin, Sungkar S (editors), Medical Parasitology, FKUI, Jakarta,2008.