



### Mosquitoes in Bangkok

From the story of mosquito in the first chapter which was told about the mosquito as the vectors of disease to man and may be to animal, and also told about the life cycle of mosquitoes, and general characteristic of mosquitoes. That chapter was the way of finding out the method of controlling mosquitoes in Bangkok. Now, Bangkok, the capital of Thailand, has very great numbers of mosquitoes which annoy the people. Among the species of mosquitoes which was found in Bangkok, there are some species that are the vector of disease. This disease is known as Thai Haemorrhagic fever which occurs with the children. Some patients may die if they have severe symptom. By this reason, it is necessary to survey the mosquitoes in Bangkok for knowing the types of them and for checking them as the vectors of disease.

From the report on surveying mosquitoes in the epidemic area of this disease by research committee of Thai Haemorrhagic fever, Department of Pathology Faculty of Medicine, Chulalongkorn Hospital, the researcher have

used many methods for surveying and collecting the samples.

These methods are :-

1. Using Mosquito light trap
2. Day time collection by sucking tube.
  - at resting place
  - while feeding on human
3. Night time collection while feeding on human
4. Collection from stables, shrubs and trees

From the method of collection mosquitoes in the above paragraph, they have found that there are forty eight species of mosquitoes in Bangkok, and fifteen species are the vectors of disease. These mosquitoes are shown on the data below :-

1. *Aedeomyia castastica*
2. *Aedes (Aedes) dux.*
3. *Aedes (Aedimorphus) mediolineatus*
4. *Aedes (Aedimorphus) taenichynchoides*
5. *Aedes (Aedimorphus) Voxans*
6. *Aedes (Nocomlaniconion) lineatopennis*
7. *Aedes (Stegomyia) Aegypti*

8. *Aedes* (*Stegomyia*) *albopictus*
9. *Armigeres* (*Armigeres*) *subalbatus*
10. *Culex* (*Culex*) *bitaeniorhynchus*
11. *Culex* (*Culex*) *fuscocephalus*
12. *Culex* (*Culex*) *gelidus*
13. *Culex* (*Culex*) *pipiens quinquefasciatus*
14. *Culex* (*Culex*) *sitiens*
15. *Culex* (*Culex*) *tritaeniorhynchus*
16. *Culex* (*Culex*) *vishnui*
17. *Culex* (*Culex*) *whitmorei*
18. *Culex* (*Culiciozyia*) *nigropunctatus*
19. *Culex* (*Lo. Acceromyia*) *rubithoracis*
20. *Culex* (*Lutzia*) *fasciatus*
21. *Culex* (*Lutzia*) *halifaxi*
22. *Culex* (*Neoculex*) *brevipalpus*
23. *Ficalbia* (*Blorleptomyia*) *luzonensis*
24. *Ficalbia* (*Ficalbia*) *minima*
25. *Ficalbia* (*Mimomyia*) *chamberlaini*
26. *Ficalbia* (*Mimomyia*) *hybrida*
27. *Malaya genurestris*
28. *Mansonia* (*Coquillettidia*) *crassipes*

29. *Mansonia (Mansonioides) indiana*
30. *Mansonia (Mansonioides) annulifera*
31. *Mansonia (Mansonioides) uniformis*
32. *Toxorhynchites splendens*
33. *Uranotaenia campestris*
34. *Uranotaenia edwardsi*
35. *Uranotaenia lateralis*
36. *Uranotaenia recondita*
37. *Anopheles aconitus*
38. *Anopheles annularis*
39. *Anopheles barbirostris*
40. *Anopheles hyrcanus argyropus*
41. *Anopheles hyrcanus nigerrimus*
42. *Anopheles hyrcanus peditaeniatus*
43. *Anopheles hyrcanus sinensis*
44. *Anopheles kocki*
45. *Anopheles philippinensis*
46. *Anopheles subpictus malayensis*
47. *Anopheles tessellatus*
48. *Anopheles Vagus*

In fortyeight species, there are only 15 species as the vectors of disease. These mosquitoes are shown in next page.

Species	Disease reported in Thailand	Vectors Disease reported in other countries	Experimental Infections
1. <i>Aedes (Stegomyia) aegypti</i>	Dengue fever THF	Yellow fever	JBE.
2. <i>Aedes albopictus</i>	Dengue fever		EEE, WEE, SLE & JBE Filariasis
3. <i>Aedes vexans</i>			
4. <i>Culex pipiens quinquefasciatus</i>	THF Filariasis	SLE	
5. <i>Culex gelidus</i>		JBE	
6. <i>Culex tritaeniorhynchus</i>		JBE	
7. <i>Culex vishnui</i>		JBE Filariasis	
8. <i>Mansonia annulifera</i>	Filariasis		
9. <i>Mansonia indiana</i>	Filariasis		
10. <i>Mansonia uniformis</i>	Filariasis		
11. <i>Anopheles barbirostris</i>	Filariasis		
12. <i>Anopheles hyrcanus nigerrimus</i>	Filariasis		
13. <i>Anopheles hyrcanus peditaeniatus</i>			Filariasis
14. <i>Anopheles hyrcanus sinensis</i>	Filariasis		
15. <i>Armigeres subalbatus</i>		Filariasis Dengue fever	

- THF = Thai haemorrhagic fever  
 JBE = Japanese B. Encephalitis  
 EEE = Eastern Equine Encephalitis  
 WEE = Western Equine Encephalitis  
 VEE = Venezuelan Equine Encephalitis  
 SLE = St. Louis Encephalitis.



Characteristic of breeding place of mosquitoes  
species in Bangkok

The breeding places where the mosquito like to stay and lay their eggs, and live on the larvae stage, will be explained in the following paragraph. Knowing the characteristic of breeding place will lead to the mosquito control in Bangkok. These breeding places are shown in following discussion

In ponds, swamps, which have the dense grasses and the water have low turbidity are the breeding place of the mosquitoes of species *Aedionymia castastica*.

Jars, vase, tin cans, broken bottles, barrel and other things which are inside the houses or stand outside the house, are the places that the species of *Aedes aegypti* like to stay and lay the eggs. All of these species always lay the eggs in the clean water.

Tree holes, such as in bamboos or rain tree may find the species of *Aedes albopictus*.

In ponds, swamp place, which have not dense grasses or small plants, these places will find the species of *Aedes lineatopennis*

Pond, swamp which have clean water, such as pond in house, *Aedes taeniorhynchoides* and *Aedes vexans* will be found.

The species of *Annigeres subalbatus* will be found in tree holes of raintrees or jars that water stagnate for long time and has very very dirty with high turbidity.

In ponds, or swamp, which has the moss, the mosquitoes of the species *Culex bitaeniorhynchus* will be found. The larvae of this species like to eat moss as the food.

In tree holes, and sometime in tank of water, the species of *Culex brevipalpis* will be found. In generally this species are found in tree holes. They like clean water

In ponds, shallow wills, which have a little grass or jars of little water with decaying leaves, will find the species of *Culex fuscarius*.

*Culex fascocephalus* will be found in pond, rice field which stagnates the water, or will be found in marshy field.

Ponds, swamps, or wells, that have the dense grasses or pools of water of turbidity in the lawn. The species of *Culex gelidus* will be found.

In the same place as the mosquito of species *Culex fuscocephalus*. The species of *Culex nigropunctatus* will be found.

The dirty water, such as in street drainages or sewers which have stagnant water or filthy water, canals, pools under houses and every places which have dirty water. The mosquitoes of species *Culex quinquefasciatus* are found. This species is the most abundant mosquitoes in Bangkok, and found in general places.

Ponds in houses will find the species of *Culex rubithoracis*.

Ponds, swamps, wells, which have the dirty water and have grasses or rotted leaves on the water surface. These places will be found the mosquitoes of species *Culex sitiens*.

*Culex tritaeniorhynchus* and *Culex vishnui* are found in ponds, wells, or general pool of water in Bangkok. In



In the places of grasses or rotted leaves on water surface and water is not dirty or bad odor will find this species.

Ponds or wells, which have the dense grasses, and water plants growing. These place will find the genus of species *Ficalbia chamberlaini*.

*Ficalbia lyzonensis* and *Ficabbia hybrida*, will find in ponds, swamps, or wells, which have the high grasses, water plants such as water lettuces, duck weeds, water hyacinthes; that grow densely; and there are the rotted leaves mixed in water.

In trees holes; banana trees, pipe-apple tree, and etc., which have the clean water, will find the species of *Malaya genurostris*

*Mansonia mansonoides* of three kinds; *annulifera*, *indiana*, and *uniformis*; will find in ponds swamps and marshes. Those places have water lettuces, water hyacinthes, and morning glories and etc.,. These species use the roots of those plants for breathing and living. The larvae do not come to the water surface at frequently intervals as the other species

*Toxorhynchites splendens* find in jars, barrels. The larvae of this species like to kill the other larvae. Sometime this kind will find in trees' holes but it is rare case.

In clean water of trees' holes, ponds, and wells, will find the mosquitoes of species *Uranotaenia*. These places have some leaves floating on water surface.

*Anopheles annularis*, *Anopheles hyrcanus*, *Anopheles philippinensis*, will find in ditches of streets, ponds, swamps, and wells. These places the grass grow densely and have some leaves or vegetables on the surface. These species like to live on shallow water and there are some mass. The water is not high turbidity and the sunshine is not strong.

*Anopheles subpictus malayensis*, *Anopheles vagus* will find in shallow pools. The base is clay, or sandy clay, and has the light. In jars, or water containers for cleaning feet; ponds, and wells, which is the shallow water; will find these species. The water is rather turbid and white.

\* Classification of Mosquitoes in Bangkok  
by  
Method of Collecting

1. The mosquitoes which were collected in New Jersey light trap, have forty four species. They are :-

1. *Aedeomyia castastica*.
2. *Aedes* (*Aedes*) *dux*.
3. *Aedes* (*Aedimorphus*) *mediolineatus*.
4. *Aedes* (*Aedimorphus*) *taeniorhynchoides*.
5. *Aedes* (*Aedimorphus*) *vexans*.
6. *Aedes* (*Neomclaniconion*) *lineatopennis*.
7. *Aedes* (*Stegomyia*) *aegypti*.
8. *Armigeres* (*Armigeres*) *subalbatus*.
9. *Culex* (*Culex*) *bilaeniorhynchus*.
10. *Culex* (*Culex*) *fuscocephalus*.
11. *Culex* (*Culex*) *gelidus*.
12. *Culex* (*Culex*) *pipiens quinquefasciatus*.
13. *Culex* (*Culex*) *sitiens*.
14. *Culex* (*Culex*) *tritaeniorhynchus*.
15. *Culex* (*Culex*) *vishnui*.
16. *Culex* (*Culex*) *whitmorei*.



17. *Culex* (*Culicidomyia*) *nigropunctatus*.
18. *Culex* (*Lophecceraomyia*) *rubithoracis*.
19. *Culex* (*Lutzia*) *fasciatus*.
20. *Culex* (*Neoculex*) *brevipalpis*.
21. *Ficalbia* (*Etorleptomyia*) *luzonensis*.
22. *Ficalbia* (*Ficalbia*) *minima*.
23. *Ficalbia* (*Mimomyia*) *chamberlaini*.
24. *Ficalbia* (*Mimomyia*) *hybrida*.
25. *Mansonia* (*Cocquillettidia*) *crassipes*.
26. *Mansonia* (*Mansonioides*) *indiana*.
27. *Mansonia* (*Mansonioides*) *annulifera*.
28. *Mansonia* (*Mansonioides*) *uniformis*.
29. *Uranotaenia* *carpestris*.
30. *Uranotaenia* *edwardsi*.
31. *Uranotaenia* *lateralis*.
32. *Uranotaenia* *recondita*.
33. *Anopheles* *aconitus*.
34. *Anopheles* *annularis*.
35. *Anopheles* *barbirostris*.
36. *Anopheles* *hyrcanus argyropus*.
37. *Anopheles* *hyrcanus nigerrimus*.

38. *Anopheles hyrcanus peditaeniatus*.
39. *Anopheles hyrcanus sinensis*.
40. *Anopheles kochi*
41. *Anopheles philippinensis*.
42. *Anopheles subpictus malayensis*.
43. *Anopheles tessellatus*.
44. *Anopheles vagus*.

2. The mosquitoes which were caught on resting places at night, have twenty six species. They were caught by using suction tube. These mosquitoes are :-

1. *Aedes (Aedimorphus) taeniorhynchoides*.
2. *Aedes (Aedimorphus) vexans*.
3. *Aedes (Aedes) dux*.
4. *Aedes (Stegomyia) aegypti*.
5. *Armigeres (Armigeres) subalatus*.
6. *Culex (Culex) bitaeniorhynchus*.
7. *Culex (Culex) fuscocephalus*.
8. *Culex (Culex) gelidus*.
9. *Culex (Culex) pipiens quinquefasciatus*.
10. *Culex (Culex) sitiens*.

11. *Culex (Culex) tritaeniorhynchus*.
12. *Culex (Culex) vishnui*.
13. *Culex (Culex) whitmorei*.
14. *Culex (Dophoceraemyia) rubithoracis*.
15. *Mansonia (Mansonioides) annuliferra*.
16. *Mansonia (Mansonioides) indiana*.
17. *Mansonia (Mansonioides) uniformis*.
18. *Anopheles aconitus*.
19. *Anopheles annularis*.
20. *Anopheles hyrcanus argyropus*.
21. *Anopheles hyrcanus nigerrimus*.
22. *Anopheles hyrcanus peditaeniatus*.
23. *Anopheles hyrcanus sinensis*.
24. *Anopheles philippinensis*.
25. *Anopheles subpictus malayensis*.
26. *Anopheles vagus*.

5. At day time collection, there are fourteen species, were collected on resting places, the wall, mosquito net, clothes by using suction tube. They are :-

1. *Aedes (Stegomyia) aegypti*.
2. *Armigeres (Armigeres) subalbatus*.

3. *Culex (Culex) tritaeniorhynchus*.
4. *Culex (Culex) gelidus*.
5. *Culex (Culex) pipiens quinquefasciatus*.
6. *Culex (Culex) sitiens*.
7. *Culex (Culex) tritaeniorhynchus*.
8. *Culex (Culex) visianii*.
9. *Mansonia (Mansonioides) annulifera*.
10. *Mansonia (Mansonioides) indiana*.
11. *Mansonia (Mansonioides) uniformis*.
12. *Anopheles hyrcanus peditaeniatus*.
13. *Anopheles hyrcanus sinensis*.
14. *Anopheles subpictus malayensis*.

4. Five species were found while feeding on human at day time.

1. *Aedes (Stegomyia) aegypti*.
2. *Armigeres (Armigeres) subalbatus*.
3. *Culex (Culex) pipiens quinquefasciatus*.
4. *Culex (Culex) gelidus*.
5. *Culex (Culex) tritaeniorhynchus*.

5. Twelve species were collected while feeding on human at night. They are :-

1. *Culex (Culex) pipiens quinquefasciatus*.
2. *Culex (Culex) gelidus*.
3. *Culex (Culex) tritaeniorhynchus*.
4. *Culex (Culex) vishnui*.
5. *Culex (Culex) sitiens*.
6. *Culex (Culex) bitaeniorhynchus*.
7. *Culex (Culex) whitmorei*.
8. *Mansonia (Mansonioides) annulifera*.
9. *Mansonia (Mansonioides) indiana*.
10. *Mansonia (Mansonioides) uniformis*.
11. *Aedes (Aedimorphus) taeniorhynchoides*.
12. *Aedes (Aedimorphus) vexans*.

6. By using swing net, twenty three species were collected. They were collected in the places near shrubs, grass, high grass, meadows, trees, and trees, holes, bamboos, banana trees. These are :-

1. *Aedes (Stegomyia) albopictus*.
2. *Armigeres (Armigeres) subalbatus*.



3. *Culex* (*Culex*) *fuscocephalus*.
4. *Culex* (*Culex*) *pipiens* *quiquefasciatus*.
5. *Culex* (*Lutzia*) *fascanus*.
6. *Culex* (*Lutzia*) *halifaxi*.
7. *Culex* (*Eophoceraomyia*) *rubithoracis*.
8. *Culex* (*Neoculex*) *brevipalpes*.
9. *Ficalbia* (*Eterleptomyia*) *luzonensis*.
10. *Ficalbia* (*Ficalbia*) *minima*.
11. *Ficalbia* (*Mimomyia*) *chamberlaini*.
12. *Ficalbia* (*Mimomyia*) *hybrida*.
13. *Mansonia* (*Mansonioides*) *annulifera*.
14. *Mansonia* (*Mansonioides*) *indiana*.
15. *Mansonia* (*Mansonioides*) *uniformis*.
16. *Malaya* *genurostris*.
17. *Toxorhynchites* *splendens*.
18. *Uranotaenia* *campestris*.
19. *Uranotaenia* *edwardsi*.
20. *Uranotaenia* *recondita*.
21. *Anopheles* *hyrcanus* *argyropus*.
22. *Anopheles* *hyrcanus* *peditaeniatus*.
23. *Anopheles* *hyrcanus* *sinensis*.

7. Nine species were caught during the day outside the houses especially in the orchard areas, while biting on human being.

1. *Aedes (Stegomyia) aegypti*.
2. *Aedes (Stegomyia) albopictus*.
3. *Armigeres (Armigeres) subalbatus*.
4. *Culex (Culex) pipiens quinquefasciatus*.
5. *Culex (Culex) gelidus*.
6. *Culex (Culex) tritaeniorhynchus*.
7. *Mansonia (Mansonioides) annulifera*.
8. *Mansonia (Mansonioides) indiana*.
9. *Mansonia (Mansonioides) uniformis*.

8. Nineteen species were collected at night while biting animal.

1. *Aedes (Aedimorphus) mediolineatus*.
2. *Aedes (Aedimorphus) vexans*.
3. *Culex (Culex) fascocephalus*.
4. *Culex (Culex) gelidus*.
5. *Culex (Culex) whitmorei*.
6. *Culex (Culex) tritaeniorhynchus*.
7. *Culex (Culex) vishnui*.

8. *Culex (Culex) bitaeniorhynchus*.
9. *Culex (Culex) pipiens quinquefasciatus*.
10. *Mansonia (Mansonioides) annulifera*.
11. *Mansonia (Mansonioides) indiana*.
12. *Mansonia (Mansonioides) uniformis*.
13. *Anopheles annularis*.
14. *Anopheles hyrcanus peditaeniatus*.
15. *Anopheles hyrcanus sinensis*.
16. *Anopheles hyrcanus argyropus*.
17. *Anopheles subpictus malayensis*.
18. *Anopheles vagus*.
19. *Anopheles kocki*.