

Floodwater Mosquitoes

(Lay eggs singly on non-aquatic surfaces outside of containers)

Chapter 5

BIONOMICS AND RECOGNITION OF IMPORTANT MOSQUITO SPECIES

One who is casually acquainted with mosquitoes may believe that all types are much the same and, indeed, the similarities between species are considerable. That person, however, may be greatly surprised at the differences in appearance and behavior from species to species (and even among some varieties within species). The differences in appearance, especially notable in the larval and adult stages, permit accurate identification of the species. The behavioral differences permit various species to occupy numerous ecological niches with relatively little overlapping. Thus, knowledge of the source or breeding habitat of mosquitoes can provide a strong clue to their identification. In Figure 21 (p. 43-44), typical breeding habitats are shown.

Mosquito control is an exacting technology requiring knowledge of the numerous differences among species to plan and effect abatements of mosquito problems. The trained worker first identifies the problem species. With identity established, the specialist possesses a number of useful facts.

While many of the physical differences between species are minor and require specialists to fully comprehend, many others are readily apparent even to workers with limited training and experience. Fortunately, most of the important Louisiana species are easily identifiable, often by a single observed feature. The breeding sites for these important species are easily recognized. This section of the manual is designed to provide mosquito-control workers with basic information, including some short-cuts, which will equip them to deal most effectively with the important and most common Louisiana mosquitoes.

Following the discussion of the bionomics of each species is a list of the principal identifying features. Illustrations of important mosquito species discussed are provided to enhance the discussions Fig. 22 (p. 45-46).

Aedes sollicitans

(Tan Salt Marsh Mosquito)

Aedes sollicitans is a salt marsh breeding species and one of the most important pest mosquitoes in Louisiana. It is also a known vector of Venezuelan equine encephalitis (VEE) and a suspected vector of eastern equine encephalitis (EEE) in Louisiana and elsewhere.

Aedes sollicitans breeds along the gulf coastal plains and in inland areas where brackish water is available. The eggs of *Ae. sollicitans* are laid on moist soil in intermediate to fresh water marshes where they remain until flooded by high tides or rains. Breeding may occur in potholes, depressions, and “runs” (small, ditch-like depressions containing specific plant species) in otherwise level areas of the marshes which are subject to periodic, but not daily, flooding. The eggs require several days of drying (conditioning) in order to hatch when flooded. Development of the aquatic stages requires 7-10 days depending of water temperature. Breeding takes place most of the year in the southern portion of Louisiana, being only briefly interrupted in cold weather, while, in the northern portions of the state, several generations are produced during the warm months.

The adults are strong fliers, often migrating in large swarms from the breeding areas in search of blood (host animals). They commonly fly 5-10 miles and may travel up to 40 miles when aided by favorable winds. Migration flights take place during early darkness and the adults are attracted to lights. During the day, the mosquitoes rest among the vegetation where they will readily attack any animal that disturbs them. They have made certain areas literally uninhabitable for humans and large animals.

Principal Identifying Characteristics (Fig. 22, p. 45)

1. Medium-sized to small golden-dark brown species.
2. Female abdomen is pointed.
3. Narrow pale bands on the bases of most segments of the tarsi and proboscis.
4. Basal dorsal bands on abdominal segments.

Aedes taeniorhynchus
(Black Salt Marsh Mosquito)

Aedes taeniorhynchus is not as prevalent in Louisiana as *Ae. sollicitans*. Nevertheless, it is sufficiently abundant to constitute a serious problem at times in certain coastal areas and in some inland situations. The breeding habitats and its biology are similar to those of *Ae. sollicitans*, although it may breed in freshwater pools near salt marshes. The adults are strong fliers and bite freely at night or in shade.

Principal Identifying Characteristics:

1. Medium-sized to small golden-dark brown species.
2. Female abdomen is pointed.
3. Narrow pale bands on the bases of most segments of the tarsi and proboscis.
4. Basal dorsal bands on abdominal segments.

Aedes vexans
(Floodwater Mosquito)

Aedes vexans is a floodwater and temporary rain pool breeding mosquito of paramount importance throughout Louisiana. This species causes a painful bite and is a potential vector of West Nile virus (WNV), EEE, California encephalitis (CE) and dog heartworm.

Ae. vexans are commonly found from March through October with several broods occurring during this period. They breed in rain pools, floodwaters, roadside puddles, and practically any temporary body of freshwater.

Winter typically is passed in the egg stage, although extended warm winter weather can lead to off-season broods with considerable pest nuisance. All eggs do not hatch with a single flooding and larvae appear periodically following alternate periods of flooding and drying during the season. Adults can migrate long distances from their breeding places, 10 or more miles being rather common.

Principal Identifying Characteristics (Fig. 22, p. 45)

1. Medium-sized, brown species.
2. Female abdomen is pointed.
3. Proboscis is unbanded whereas tarsi possess very narrow pale basal bands.
4. Basal abdominal pale bands constricted at the middle to form an inverted "V."

Psorophora columbiae
(Dark Rice Field Mosquito)

Psorophora columbiae is the most widespread and important species of *Psorophora* in the United States. It occurs throughout Louisiana and reaches considerable abundance in the riceland ecosystem. The females are fierce biters, attacking anytime during the day or night. In large numbers, they can kill livestock and make it practically unbearable for people to remain outdoors. For these reasons, this species would qualify as one of the most troublesome and economically important Louisiana mosquitoes. Its importance was heightened during the summer of 1971 when an epidemic VEE transmission occurred in the southern United States from Mexico.

Eggs of *Ps. columbiae* are deposited on moist soil that is subject to flooding. Situations with low, rank vegetation are ideal for egg deposition. Drained rice fields, fallow rice fields, and pastures are among the most favorable sites. Eggs must undergo a 4-5 day period of maturing before being able to hatch. Once matured, they can hatch within a few minutes of being flooded. Overwintering is in the egg stage. The larvae of *Ps. columbiae* breed in temporary rain pools, irrigation and floodwaters, and in seepage pools. The larval period is characteristically very short; during midsummer, it may be completed in as little as 3.5-4 days. The pupal stage requires another 1-2 days. The number of generations per year varies from few to many, depending upon suitable hatching conditions and local temperatures. Areas which dry up and are then flooded a few days later may produce larvae with each flooding. Adults may live as long as 1-2 months. They have a flight range of up to 10 miles or more.

Principal Identifying Characteristics (Fig. 22, p. 45)

1. Medium to large black species.
2. Female abdomen is pointed.
3. Apical pale marking on abdomen; markings triangular in shape or divided into paired submedian patches.
4. Proboscis broadly banded with white.
5. Tarsi basally banded with white the first hind tarsal segment with a broad median white ring as well.

Psorophora ferox
(Woodland Mosquito)

Psorophora ferox occurs in woodland areas of the gulf coast states. It is particularly annoying to homeowners who build homes on partially cleared woodland areas and attempt to enjoy outdoor activities with family and friends. Activity and blood feeding is most intense during daylight hours, and feeding often seems to target the upper body and head of human hosts.

Principal Identifying Characteristics (Fig. 22, p. 46)

1. Body scales of adult are brilliant blue-purple.
2. Female abdomen pointed.
3. Last two segments of hind tarsi are totally white.
4. Larva has antennae longer than length of head.

Container-Breeding Mosquitoes

(Lay eggs singly on non-aquatic surfaces inside of containers)

Aedes aegypti
(Yellow Fever Mosquito)

Aedes aegypti is the urban vector of yellow fever and dengue fever viruses throughout the tropical and subtropical regions of the world. It also has been implicated as a potential urban WNV vector. *Aedes aegypti* is permanently established in the southern portion of the United States, where frequently it becomes locally abundant and readily available to transmit reintroduced yellow fever or dengue viruses.

Aedes aegypti is a peri-domestic species of mosquito imported from Africa more than 300 years ago. In the U.S., larvae develop mainly in containers outdoors such as tin cans, jars, bottles, dishes, and children's wading pools near human habitations. They are often found in flower vases in cemeteries, in clogged roof gutters, in discarded vehicle tires, and in other types of human-generated artificial containers. Originally, *Ae. aegypti* bred in rot holes in trees and may occasionally still be found in such habitats. The adult female typically prefers the blood of humans to that of other animals, typically seeking to feed during the daytime periods just after sunrise and just before sunset. It is a stealthy mosquito often succeeding in taking blood meals from the lower body and ankles. The larvae are likewise evasive, descending to the bottom of their breeding containers upon the passage

of light or upon being physically disturbed. They remain motionless, often for a sufficient period of time to be overlooked.

Principal Identifying Characteristics (Fig. 22, p. 45)

1. Small to medium-sized brownish-black species with silver accent markings.
2. Female abdomen is pointed.
3. Distinctive lyre-shaped pattern of white scales on the thorax.
4. Proboscis is unbanded whereas tarsi possess pale basal bands.
5. Abdomen dark with narrow basal bands.

Aedes albopictus
(Asian Tiger or Forest Day Mosquito)

Aedes albopictus is a species native to Southeast Asia. In recent decades it has spread to Hawaii, North America, Central and South America, and Southern Europe. In the U.S., the species was first discovered in the area of Houston, TX, in 1985, and has since spread to at least 26 eastern states. Shiploads of natural rubber scrap tires from northern Japan have been identified as the source of Houston's initial population of *Ae. albopictus*. The interstate transportation of used and scrap tires is now the primary means of its dissemination. This species breeds abundantly in many of the same types of natural and artificial containers that *Ae. aegypti* is known to use, particularly tires. Shiploads of natural rubber scrap tires from northern Japan have been identified as the source of Houston's initial population of *Ae. albopictus*.

The Asian tiger mosquito can transmit several disease pathogens (e.g., dengue fever, yellow fever, and dog heartworm to a limited extent). In the U.S., it has also been implicated as a potential vector in transmission of WNV, EEE, and California encephalitis CE)/LaCrosse (LAC) viruses. However, most mosquito control personnel in the U.S. will agree that its aggressive biting behavior toward humans is the primary reason for most complaints. It seeks blood meals during the daytime at about the same time as *Ae. aegypti* (2-3 hours after sunrise and before sunset). The females are weak flyers like *Ae. aegypti*, i.e., usually not dispersing more than several hundred feet from their larval developmental habitat. When they do fly, they generally stay close to the ground thereby avoiding strong or gusty winds.

There is substantial evidence that the Asian tiger mosquito, through competitive displacement, has replaced the yellow fever mosquito and *Ae. triseriatus*

(Eastern Treehole Mosquito) in breeding sites in parts of the other two species' geographic range. Except in large subtropical urban areas, *Ae. albopictus* has replaced *Ae. aegypti* in the U.S. For example, in Atlanta and areas north, *Ae. aegypti* is no longer found; however, in New Orleans, Houston, Miami, and areas south, *Ae. aegypti* is still present in significant numbers in some areas. Likewise, in more suburban areas where *Ae. triseriatus* formerly was abundant, *Ae. albopictus* is now the primary artificial and natural container colonizer.

Principal Identifying Characteristics (Fig. 22, p. 45)

1. Small to medium-sized black species with silver accent markings.
2. Female abdomen is pointed.
3. Similar in appearance to *Ae. aegypti*; but, in place of lyre-shaped pattern, there is a distinctive median narrow stripe of white scales on the thorax.
4. Proboscis is unbanded whereas tarsi possess pale basal bands.
5. Abdomen dark with narrow basal bands.

Aedes triseriatus

(Eastern Tree Hole Mosquito)

Although traditionally a woodland tree hole inhabiting mosquito, *Ae. triseriatus* can also often be found quiet often with *Ae. albopictus* in the same ecological niche around human habitations in small urban and suburban areas of Louisiana. The species is frequently collected from such man-made containers as discarded tires, buckets, and even beer and soft-drink containers.

The bite is painful and the species is frequently troublesome in both suburban and wooded areas. *Aedes triseriatus* is considered to be the primary vector of CE/LAC in the Midwest and Eastern U.S. It has also been implicated in WNV and dog heartworm transmission. Females tend to feed during the day, but prefer shaded areas to full sun. Larval development is slower than that of *Ae. aegypti* and *Ae. albopictus*, and those species may predominate in areas where distribution overlaps during the warmest season. *Aedes triseriatus*, however, is more cold-hardy and ordinarily is most abundant early and late in the season.

Principal Identifying Characteristics (Fig. 22, p. 45)

1. Medium-sized black species.
2. Female abdomen is pointed.
3. Tarsi and proboscis not ringed with light scales.
4. Sides of thorax covered with silvery-white scales separated by a broad central area of dark brown scales which broadens apically and contains a small median light colored area.
5. Abdomen blue-black with basal patches of lateral white scales.

Permanent Water Mosquitoes

(Lays eggs singly on water surface)

Anopheles quadrimaculatus

(Malaria Mosquito)

Anopheles quadrimaculatus was historically, and remains as the potentially principal vector of malaria east of the Rocky Mountains. It has also been implicated in WNV and dog heartworm transmission. It occurs throughout the central and eastern U.S. and is very abundant in the southeastern states in rural and suburban areas. *Anopheles quadrimaculatus* is a freshwater mosquito found breeding in swamps, marshes, lake margins, rice fields, and slowly-moving streams that are usually alkaline. The larvae prefer permanent or semi-permanent water containing floating debris or emergent vegetation, which provides protection from predators. During the summer the larval period is relatively short, about 12-14 days. The pupal period generally requires another 2-3 days. From 8-10 generations per year can be expected in the Louisiana.

In recent years, bionomic and genetic studies of this species have shown that it is actually a complex of five species, all of which occur in Louisiana. Based on the 1997 publication by Reinart et al., the species in the complex are now known as (in alphabetical order): *An. diluvialis* Reinert, (new species); *An. inundatus* Reinert, (new species); *An. maverlius* Reinert, (new species); *An. quadrimaculatus* Say; *An. smaragdinus* Reinert, (new species). Unfortunately, the adult females of this species complex are very difficult to differentiate based on the characters typically used for identification in an operational context. There are differences described in all life stages, including eggs, larvae, pupae, males and females, but often special preparations or techniques are required to visualize those differences.

Based on laboratory infection studies, distribution, and feeding behavior, it is thought that the species that still retains the original name, *An. quadrimaculatus*, was the mosquito primarily responsible for malaria transmission in the eastern U.S. in the past. However, a more recent study by Levine et al (2004) concludes that in areas where transmission was heavy, some of the other species in the complex probably contributed to local transmission.

In general, the newly described species differ in geographic distribution, feeding behavior, and habitat associations. Three of the five species can be found throughout Louisiana, with all five of them occurring in the southern half of the state. Those interested in knowing more are urged to consult the Reinert et al. (1997) and Levine et al (2004) publications for specifics. The second publication contains updated distributions maps of the species.

Principal Identifying Characteristics (Fig. 22, p. 46)

1. Medium-to large-sized, to brown species. Palpi as long as the proboscis.
2. Female abdomen dark and blunt.
3. Each wing with four dark spots.
4. Pale knee spots on femora and tibiae.

Anopheles crucians

Anopheles crucians is susceptible to infection by malaria parasites in the laboratory; however, should the disease occur in the U.S., it is not regarded as a potentially significant natural vector. It readily bites humans and if sufficiently abundant this species can become a significant pest throughout the southern part of Louisiana. *Anopheles crucians* breeds in acidic fresh water such as that in cypress swamps, rice fields, and ponds. Larvae also occur in other habitats such as lake margins and sluggish streams. Adults rest in shelters and are readily attracted to light traps. The flight range is about one mile.

Another *Anopheles* species, *An. bradleyi*, also occurs in brackish water habitats in Louisiana marshlands. The adult stage cannot be distinguished from *An. crucians* and their life cycles are similar.

Principal Identifying Characteristics (Fig. 22, p. 46)

1. Medium-sized dark brown species. Palpi as long as the proboscis.
2. Female abdomen dark brown and blunt.
3. Wings, alternating white and dark spots. Wing tip white, three dark spots on anal vein, and front margin of wing dark scaled.

Permanent Water Mosquitoes

(Lay egg rafts on water surface)

Culex quinquefasciatus

(Southern House Mosquito)

Culex quinquefasciatus is abundant throughout the state. This species is the major vector of WNV and St. Louis encephalitis (SLE) in Louisiana, and it has long been considered the primary vector of dog heartworm. However, a study by Lowrie (1991) using several Louisiana strains, showed *Cx. quinquefasciatus* was a poor vector of the parasite, but this may vary with strains found elsewhere. While its preferred hosts are birds, it will readily feed upon humans and to a lesser extent on dogs. The abundance of the species and its feeding habits allow it to play a significant role in transmitting WNV and SLE from the bird reservoir to man. The species is most active at night, and will readily enter houses to feed.

The southern house mosquito breeds prolifically in water that contains a high level of organic matter. It occurs in roadside ditches, catch basins, septic ditches, sewage oxidation ponds, storm water pump station reservoirs, septic tank and sewage treatment plant effluent, water contaminated with wastes from vegetables and meat-processing plants, and in man-made containers. Somewhat paradoxically, the greatest numbers are often encountered during dry spells when evaporation exceeds replenishment of water, resulting in the concentration of pollution in water bodies as they shrink.

Principal Identifying Characteristics (Fig. 22, p. 46)

1. Medium-sized light brown species.
2. Female abdomen blunt.
3. No distinctive markings on legs, proboscis, or wings.
4. Pale “half moon-shaped”, basal bands on abdominal segments.

Culex salinarius

Culex salinarius is found statewide, however, it reaches its greatest abundance in the Louisiana coastal region. It is a known vector of SLE and played a role in the transmission of the virus the major epidemic of 1975 and in subsequent smaller outbreaks. More recently, it has been implicated as a likely bridge vector to bring WNV from birds to humans and other

non-avian hosts. The species is most active during the spring and fall months when its populations attain their highest numbers. It is during the summer time that *Cx. salinarius* larvae and adults are difficult to locate. The larvae breed in fresh and brackish water in various habitats. Along the coast, breeding occurs mostly in the fresh, intermediate, and brackish marshes; elsewhere throughout the state, the larvae may occur principally in either fresh or foul water in ponds, pools, ditches, and, occasionally, in barrels or bilge water in boats. The females bite readily outdoors, usually during the early evening hours, and occasionally enter dwellings.

Principal Identifying Characteristics:

1. Medium-sized brownish species.
2. Female abdomen blunt.
3. No distinctive markings on legs, proboscis, or wings.
4. Abdomen mostly dark-brown scaled, often with narrow to moderately broad basal bands of dingy yellow scales.

Culiseta melanura

Culiseta melanura is an important vector in the bird-to-bird cycle of EEE transmission, and is likely involved in a similar fashion in the WNV transmission cycle in Louisiana. In this sense, they act to maintain both of these viruses in the local environment. *Cs. melanura* feeds exclusively on birds, consequently other mosquito species (such as *Culex* or *Aedes* species) are responsible for human and horse infections because they will feed on birds in addition to humans and horses. Little is known of the habits of *Cs. melanura* adults except that they are attracted to lights as are many species. Females can be collected from resting boxes in the morning hours by use of suction aspirators.

Larvae of *Cs. melanura* often occur in small permanent to semi-permanent bodies of water, particularly around hardwood swamps, and in boggy palmetto filled areas. The larvae occur during late fall, winter, and early spring when water temperature is less than 60 F.

Principal Identifying Characteristics:

1. Medium-sized dark brownish species.
2. Female abdomen blunt.
3. No distinctive markings on proboscis or wings. Abdomen usually appears unmarked when viewed from above.
4. Legs entirely dark scales except for pale

posterior surface of femora.

5. Proboscis long.
6. Tuft of dark setae arising from the base of the subcostal vein on the underside of the wing.

Culiseta inornata

(Winter Mosquito)

Culiseta inornata is prevalent only during the colder part of the year in Louisiana. Because it is readily attracted to light, it can be collected in significant quantities in light traps. The females are seldom persistent biters, although they do occasionally attack humans. The species prefers to feed on large domestic animals and may become very troublesome to livestock. *Cs. inornata* has been implicated as a possible WNV vector, but because it tends to have low numbers during the summer months in Louisiana, it is not likely to be a major contributor to transmission in the state. However, its role in overwintering the virus is plausible but not proven.

The larvae occur in such situations as ground pools, salt marshes, and ditches, often with pollution. Large populations occur in cattle hoof prints during the late fall, winter, and early spring when pastures contain abundant surface water. They have also been collected from abandoned tires and other artificial containers, as well as from abandoned swimming pools in the New Orleans area following Hurricane Katrina in 2005.

Principal Identifying Characteristics: (Fig. 22, p. 46)

1. Large species with speckles brown and white scales.
2. Broad wings.
3. Female abdomen blunt.
4. Abdomen with yellowish-white dorsal bands which widen laterally.
5. Tuft of yellowish setae arising from the base of the subcostal vein on the undersurface of the wing.

Coquillettidia perturbans

(Salt and Pepper Mosquito)

This is a troublesome species that bites in the early evening, and occasionally during the daylight hours in shade near its breeding area. The females readily enter houses and bite viciously. They are strong fliers. EEE and WNV have been recorded from wild-caught *Cq. perturbans*, but its role in the epidemiology of these viruses has not been determined.

Species of the genera *Coquillettidia* have a unique morphological adaptation. They have teeth-like structures on the siphon tube of the larva called a dorsal saw and on the trumpets of the pupa that enable them to attach to the root of aquatic plants. Since these stages, for the most part, are passed entirely submerged, it is commonly cited in the literature that this attachment allows the larva and pupa to obtain oxygen from the plant's root system. But this is not the case. They get their oxygen from the water by osmosis much like fish. Detection of breeding sites is very difficult as the larvae quickly detach themselves from the host plants whenever they are disturbed. [This is also true for the species in the genus *Mansonia*.]

Breeding of *Cq. perturbans* takes place in marshes, ponds, and lakes which have a thick growth of aquatic vegetation. Larvae have been found associated with alligator weed, pickerel weed, cattail, water lettuce, arrowhead, aquatic sedges, and other aquatic plants. Larval development is slow, usually requiring several months. Larvae, which are produced in one season ordinarily, do not complete their development until the following spring. The adults emerge in late spring or early summer. Throughout most of its range, *Cq. perturbans* appears to have only one generation per year.

Principal Identifying Characteristics: (Fig. 22, p. 46)

1. Moderately large speckled light and dark brown species.
2. Female abdomen blunt.
3. Wing scales very broad, mixed brown and white.
4. Proboscis and tarsi ringed with white first tarsal segment of all legs with a single broad white ring in the middle.
5. Abdomen dark scaled with pale basolateral patches and occasionally with narrow basal segmental bands.

Summary

Selected biological and ecological data on important species of mosquitoes are summarized in Tables 2 and 3, p. 47. A list of all species found in the state of Louisiana with their relative prevalence and importance is given in Table 4, p. 48.



Fallow Rice Field - Used as Pasture



Rice Field



Cut Rice Field



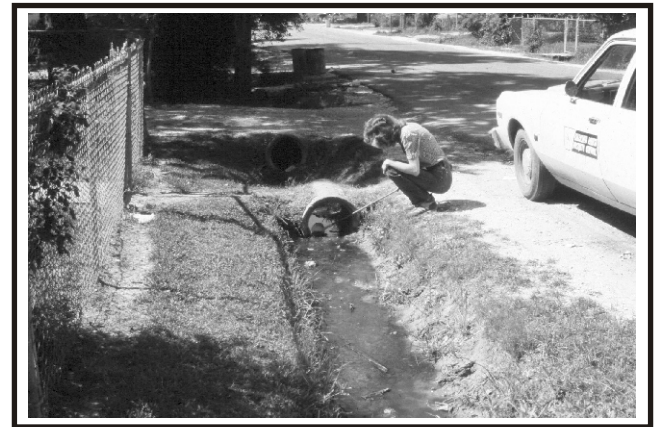
Used Tires

Figure 21

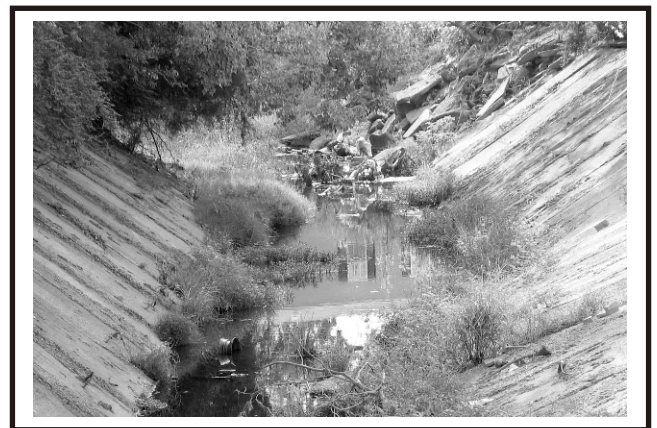
TYPICAL MOSQUITO BREEDING HABITATS



Salt Marsh



Septic Ditch



Drainage Ditch



Fresh Water Swamp



Woodland Swale



Culvert Drainage



Underground Drainage Inlet

Figure 21 (Cont'd)

Additional Mosquito Breeding Habitats



Water Holding Containers



Vacant Swimming Pool



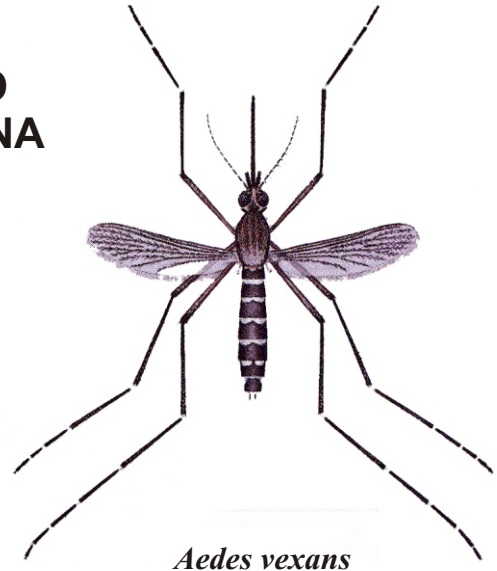
Other Water Holding Containers

Figure 22

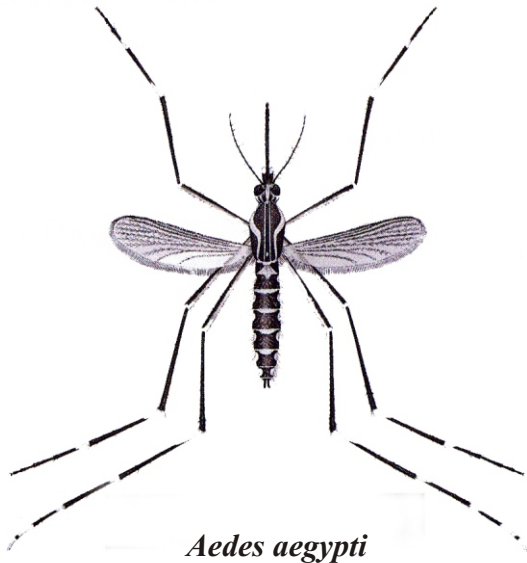
**MOSQUITO
OF LOUISIANA**



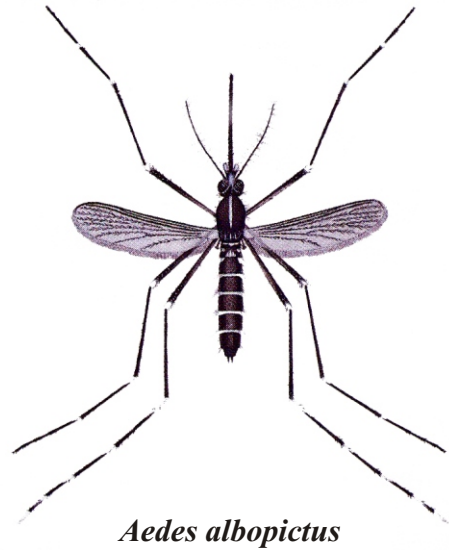
Aedes sollicitans



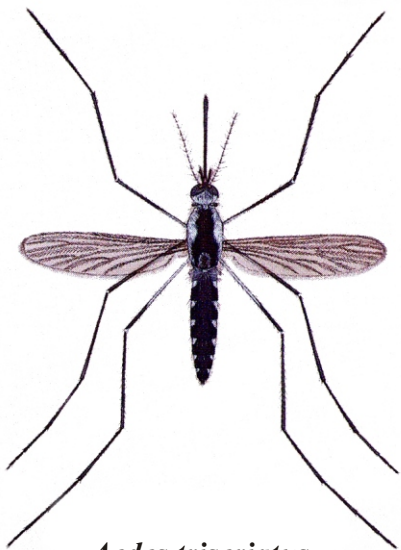
Aedes vexans



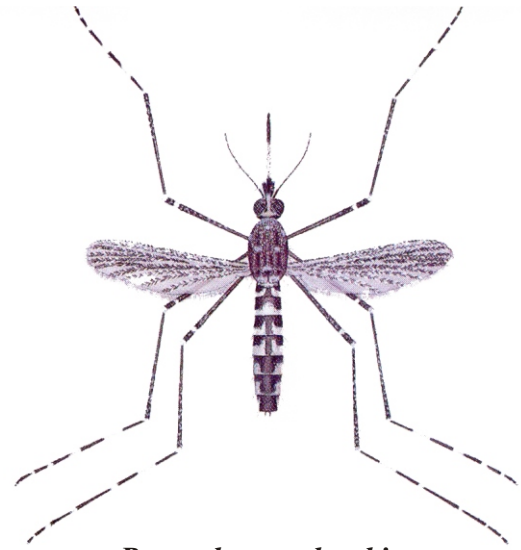
Aedes aegypti



Aedes albopictus

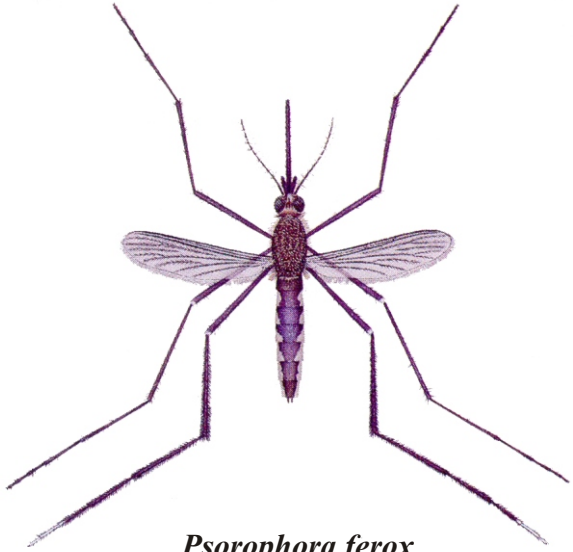


Aedes triseriatus

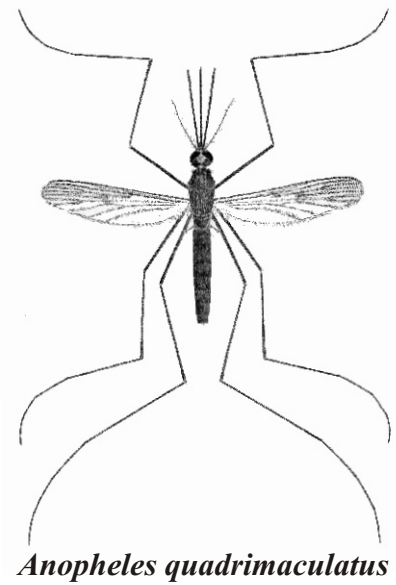


Psorophora columbiae

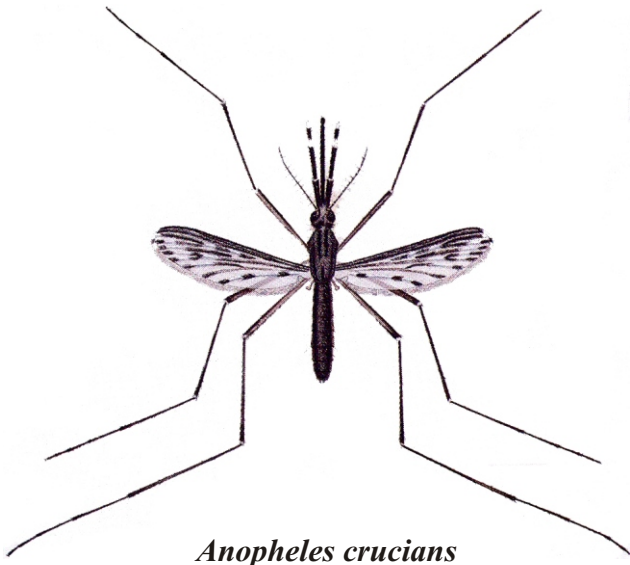
Figure 22 (Cont'd)



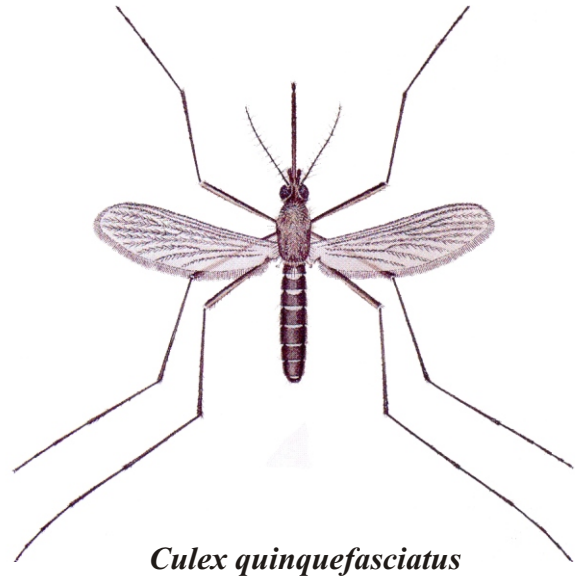
Psorophora ferox



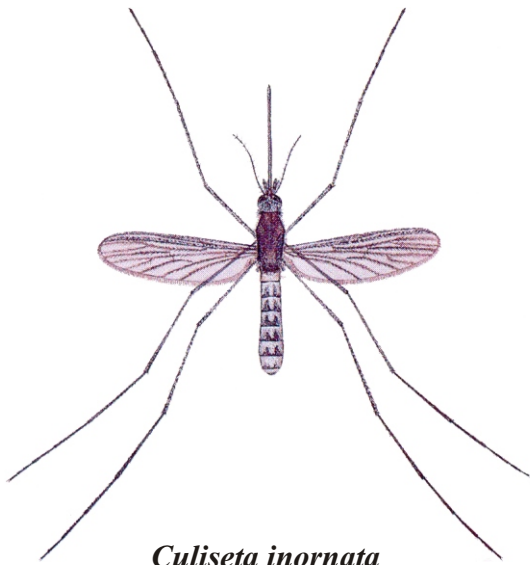
Anopheles quadrimaculatus



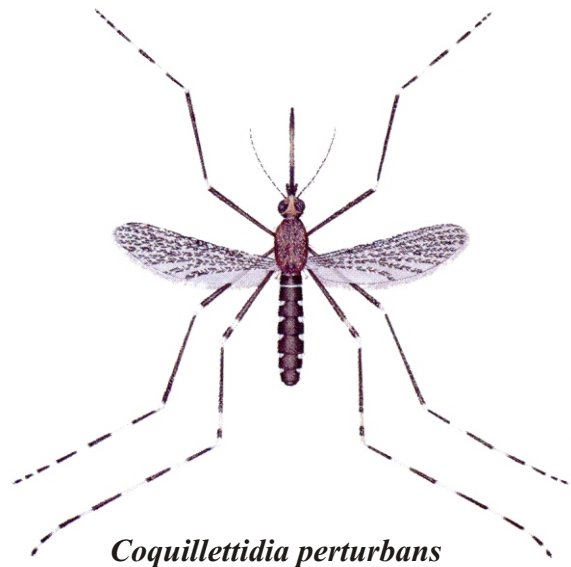
Anopheles crucians



Culex quinquefasciatus



Culiseta inornata



Coquillettidia perturbans

Table 2. Biological Data on Some Important Species

Mosquito Species	Oviposition Sites	Broods per year	Overwintering Stage
<i>Anopheles quadrimaculatus</i>	Singly on water Many		Adult female
<i>Aedes aegypti</i>	Singly on sides of containers or rarely tree holes	Many	Egg
<i>Aedes albopictus</i>	Singly on sides of containers or rarely tree holes	Many	Egg
<i>Aedes triseriatus</i>	Singly on sides of containers or rarely tree holes	Many	Egg
<i>Aedes sollicitans</i>	Singly on ground	Many	Egg
<i>Aedes taeniorhynchus</i>	Singly on ground	Many	Egg
<i>Aedes vexans</i>	Singly on ground	Many	Egg
<i>Culex quinquefasciatus</i>	Rafts on water	Many	Adult female
<i>Culex salinarius</i>	Rafts on water	Many	Adult female
<i>Culiseta melanura</i>	Rafts on water	Many	Adult female or larvae
<i>Coquillettidia perturbans</i>	Rafts on water	Single	Larva
<i>Psorophora ciliata</i>	Singly on ground	Many	Egg
<i>Psorophora columbiae</i>	Singly on ground	Many	Egg

Table 3. Ecological Data on Some Important Species

Mosquito Species	Preferred larval habitat	Effective flight range
<i>Anopheles quadrimaculatus</i>	Permanent shaded water	1 mile
<i>Aedes aegypti</i>	Artificial containers	1 block (less than 1 mile)
<i>Aedes albopictus</i>	Artificial containers, especially tires and tree holes	1 block (less than 1 mile)
<i>Aedes sollicitans</i>	Temporary pools, usually brackish or with sulphates	5 - 40 miles
<i>Aedes taeniorhynchus</i>	Temporary pools, usually brackish	5 - 20 miles
<i>Aedes triseriatus</i>	Tree holes, artificial containers	½ to 1 mile
<i>Aedes vexans</i>	Temporary pools	5 - 20 miles
<i>Culex quinquefasciatus</i>	Permanent water with organic matter or pollution, artificial containers	1 mile or more
<i>Culex salinarius</i>	<i>Fresh and brackish water in a number of situations</i>	1 mile or more
<i>Culiseta melanura</i>	<i>Permanent shaded freshwater swamps</i>	¼ to 1 mile
<i>Coquillettidia perturbans</i>	<i>Permanent water with some aquatic vegetation</i>	1 - 5 miles (or more)
<i>Psorophora ciliata</i>	Temporary pools, rice fields, pastures	1 - 5 miles
<i>Psorophora columbiae</i>	Temporary pools, rice fields, pastures	5 miles or more

Table 4. Species of Mosquitoes Found in Louisiana and Their Relative Importance

Genus and Species	Relative Importance	Genus and Species	Relative Importance	Genus and Species	Relative Importance
<i>Aedes aegypti</i>	3	<i>Anopheles atropos</i>	5	<i>Culex tarsalis</i>	5
<i>Aedes albopictus</i>	1	<i>Anopheles barberi</i>	5	<i>Culex territans</i>	4
<i>Aedes atlanticus</i>	2	<i>Anopheles bradleyi</i>	5	<i>Culiseta inornata</i>	4
<i>Aedes canadensis</i>					
<i>canadensis</i>	2	<i>Anopheles crucians</i>	2	<i>Culiseta melanura</i>	3
<i>Aedes cinereus</i>	5	<i>Anopheles diluvialis</i>	3	<i>Coquillettidia perturbans</i>	2
<i>Aedes dorsalis</i>	5	<i>Anopheles georgianus</i>	5	<i>Mansonia dyari</i>	5
<i>Aedes dupreei</i>	5	<i>Anopheles inundatus</i>	3	<i>Mansonia titillans</i>	5
<i>Aedes epactius</i>	5	<i>Anopheles maverlius</i>	3	<i>Orthopodomyia alba</i>	5
<i>Aedes fulvus pallens</i>	5	<i>Anopheles perplexens</i>	5	<i>Orthopodomyia signifera</i>	5
<i>Aedes grossbecki</i>	5	<i>Anopheles pseudopunctipennis</i>	5	<i>Psorophora ciliata</i>	2
<i>Aedes hendersoni</i>	5	<i>Anopheles punctipennis</i>	3	<i>Psorophora columbiae</i>	1
<i>Aedes infirmatus</i>	3	<i>Anopheles</i>	1	<i>Psorophora cyanescens</i>	2
		<i>quadrimaculatus</i>			
<i>Aedes mitchellae</i>	5	<i>Anopheles smaragdinus</i>	3	<i>Psorophora discolor</i>	5
<i>Aedes nigromaculis</i>	5	<i>Anopheles walkeri</i>	5	<i>Psorophora ferox</i>	2
<i>Aedes sollicitans</i>	1	<i>Culex coronator</i>	5	<i>Psorophora horrida</i>	5
<i>Aedes sticticus</i>	5	<i>Culex declarator</i>	5	<i>Psorophora howardii</i>	5
<i>Aedes taeniorhynchus</i>	2	<i>Culex erraticus</i>	4	<i>Psorophora longipalpus</i>	5
<i>Aedes thibaulti</i>	5	<i>Culex nigripalpus</i>	4	<i>Psorophora mathesoni</i>	2
<i>Aedes tormentor</i>	5	<i>Culex peccator</i>	5	<i>Toxorhynchites rutilus</i>	5
				<i>rutilus</i>	
<i>Aedes triseriatus</i>	1	<i>Culex pilosus</i>	5	<i>Toxorhynchites rutilus</i>	5
				<i>septentrionalis</i>	
<i>Aedes trivittatus</i>	5	<i>Culex pipiens</i>	1	<i>Uranotaenia lowii</i>	4
		<i>quinquefasciatus</i>			
<i>Aedes vexans</i>	1	<i>Culex restuans</i>	2	<i>Uranotaenia sapphirina</i>	4
<i>Aedes zoosophus</i>	5	<i>Culex salinarius</i>	1	<i>Total*</i>	68

Key to Relative Importance Categories:

- 1 - Economically/medically important, abundant species
- 2 - Locally abundant and annoying species
- 3- Economically/medically important, no-abundant species
- 4- Common species, not very troublesome
- 5 Very restricted distribution or rage

* Note: three species, *Culex abominator*, *Psorophora signipennis*, and *Uranotaenia anhydor*, have not been described from Louisiana but likely rarely occur in the state, based on distribution records from bordering states.