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## A Guide to the Common Mosquitoes of Grand Junction Colorado.

Carter Synhorst

*University of Nebraska-Lincoln*

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# **A Guide to the Common Mosquitoes of Grand Junction Colorado.**

By Carter Synhorst  
The University of Nebraska  
ENTO 888  
Masters Project

# Is a Mosquito Just a Mosquito?

Mosquitoes are all over the Grand Valley, but most people think that a mosquito is just a mosquito. They don't stop to consider that there are many different species here in the Grand Valley. When and where you are getting attacked by them, can determine what type of mosquito it is. There are many different species of mosquitoes here that can vary from Fruita, to Grand Junction, and even into Palisade. There are over twenty-five different species here in our valley, and there are even more on the Grand Mesa and Glade Park. Altitude has a huge impact on where each type lives. Each species of mosquito has different habitats and behaviors as well. Some live and breed down by the river, and others prefer to grow and thrive in your backyard. When people think of the common times, they get bit, like hiking or fishing for example, they think of the large swarms of mosquitoes that attack them during these times. Thankfully, these mosquitoes usually do not carry any human diseases. These are just the annoyance mosquitoes that hatch off down by the rivers or in the fields. The most important mosquitoes here in Grand Junction are the ones that can spread West Nile Virus (WNV). There are only three common species here that are the primary carriers of the disease. These are usually the mosquitoes that sneak into your house, to bite you in the middle of the night. Occasionally, we even get some mosquitoes from other states that are transported here accidentally. They can arrive on large semi-trucks or even on potted plants that get brought into the home improvement stores. This booklet will help you to tell the difference between the nuisance mosquitoes and the ones that are of medical significance.

## Why are mosquitoes a problem?

Mosquitoes are the deadliest animal in the world. It's not the actual mosquito itself, it's the viruses and parasites that

they can carry that are the real killers. Malaria, Zika, Yellow Fever, Dengue, Rift Valley Fever, WNV, Chikungunya, and St. Louis Encephalitis are just a few of the many diseases that they are known to transmit. They even carry some animal specific diseases. The mosquito uses its saliva to numb the area where it bites as well as to keep the blood from clotting while they drink it. This saliva is where the disease is transmitted back and forth. If the mosquito flies away without being swatted, it will actually re-ingest some of its saliva and leave less in you. Most people don't think about this and they squish it before it is finished taking its blood meal. There is no data to prove which way transmits fewer diseases. It's best to prevent them from biting in the first place. All its saliva, along with any diseases that it might be carrying will be left in your blood if it is squished mid bite. The overwhelming majority of mosquitoes do not have any diseases in their saliva though. The process for a mosquito to pick up a disease is quite long and complicated, that is why they are so rare in Grand Junction.

Not all mosquito diseases are deadly, some just leave people with issues that can last their whole life. Rift Valley Fever is a very prevalent disease in Australia, and it has a very low mortality rate. However, this disease can leave people with horrible arthritis that will haunt people for many years. Their joints can ache all the time or just flare up sporadically with pain. This disease is rarely talked about, because it is not deadly, but it is still important to know that these insects can transmit numerous diseases wherever they're found.

The mosquitoes that spread Malaria are in the genus *Anopheles*. This genus is present all over the world, even here in Grand Junction. The parasite, *Plasmodium*, that causes this disease kills a person every two minutes and a person is infected every fifteen seconds, mostly in the equatorial part of the world (WHO, 2020). This disease is also especially hard on children. They are infected at a higher rate because they can't protect themselves as easily as an adult. They are either too young to defend themselves or they do not know how deadly this insect is. Malaria is mostly found in Africa, which has over 90% of the cases in the world (WHO, 2020). However, it is still

found in South and Central America as well as Asia. It used to be found in the Southern United States as well. During the Civil War, there were many deaths from this disease, over 10,000 soldiers died from it (Hong, 2007). The U.S. government declared war on this disease in the 1950's and they were able to largely eliminate it from our borders. There are still cases each year, but these are mostly from people who travel and catch the disease in a different country.

Another disease that played an incredible role in the shaping of the United States was Yellow Fever. This disease was a scourge upon the land during the colonial time period. It was all along the Eastern Seaboard and down through the South. When this disease hit Philadelphia, it was so bad that it was later dubbed "The American Plague" (Crosby, 2003). The sanitation practices and the overall layout of the city provided an incredible breeding ground for the mosquitoes. They were able to increase their numbers exponentially, and on some streets, there was up to a 60% mortality rate from Yellow Fever (Spatkin, 2004). The moving of our Nation's Capital also came from this outbreak. George Washington and Congress had been working on moving our Nation's Capital out of Philadelphia for a few years, but when the epidemic hit the city, it was one of the final straws in their decision (Philadelphia, n.d.). This disease made a profound impact on many other cities in the United States that are still seen today.

One of those that was greatly affected by this disease was New Orleans and the State of Louisiana in general. The famous French leader, Napoleon Bonaparte, sent his troops to attack the people who lived on the island of modern-day Haiti, to claim the land. They were then supposed to head to New Orleans. The initial attack was quite successful, but then the mosquitoes attacked the French. The mosquitoes were so prevalent, and so full of this disease, that many of his troops began to die from Yellow Fever. Nearly 25,000 thousand troops died on this mission from Yellow Fever, this caused Napoleon to rethink his strategy (Krainer, 17). His new plan was to sell off the land that France had in the New World to raise funds for attacking Britain. This decision resulted in the Louisiana

Purchase, and it would have never happened if it wasn't for the mosquito. This giant piece of land included much of the Midwest as well as part of Colorado.

## The Mosquitoes of Grand Junction

Grand Junction and the surrounding areas have had a problem with WNV since 2004. This was when the virus really became a problem and started to cause numerous human cases. Hundreds of people were infected when this disease originally came to the valley. Besides so many people feeling unwell, there were many people also died due to this virus. The worst year for Grand Junction was 2005. The numbers have steadily declined ever since, but it is now endemic in our area. In 2019, there were only six total human cases in Mesa County, and there were zero fatalities. By August of 2020, there have been Zero cases. The Mesa County Health Department keeps a record of how many cases that there is each year. Every year a few people get sick enough to go to the doctor for this disease. Most people who are infected with WNV do not get sick enough to go to the doctor. Some people just get a headache for a few days, or flu-like symptoms. Then there are the people that this disease will affect in a more profound way. They can have life altering symptoms that may paralyze them or leave them with extreme chronic fatigue. Unfortunately, this disease is fatal to some people. It is less than one percent of the people that contract it, but it is still too many. That is why it is so important to wear bug spray and protect yourself. Although, WNV is not the first mosquito disease to be a problem in this area.

In 1985, St. Louis Encephalitis (SLE) spread throughout the valley and caused an epidemic (Tsai, 1988). This makes sense because it was one of the wettest years in the valley's history as well. There was more water and more sources for these mosquitoes to breed in. The snowpack for that year was over 200% of normal, and it was a warm Spring, so the snow melted fast. The *Culex tarsalis* and *pipiens* were responsible for spreading this disease throughout the valley. The flood of 1985 was so incredible that the Colorado River spread out from the bluffs of the Redlands up to the Interstate near 22 Road, which

is over a half a mile wide. The Colorado River also spread out near Connected Lakes State Park from the base of the South Rim neighborhood all the way to the current Riverside Parkway, again over a half a mile. The river has not reached this level again thankfully, but there are more measures in place now to deal with the water. This much water created nearly unlimited habitats for the mosquitoes.

The 1980's outbreak of SLE was not the first time that the Grand Valley has seen this disease. Back in 1956, there were over thirty cases reported around Grand Junction, and this is actually very high because there were less than 20,000 people residing in the area (Giddings, 1959). This outbreak occurred right after this disease first appeared back in St. Louis. The authors of this study do not list which mosquito was the main vector of the outbreak, but the *Culex* mosquitoes are the most common mosquitoes to carry the disease in the area. The flood water was also not especially high that year, but since this disease was so new, it spread throughout the population quite easily.

The water from the Colorado and Gunnison Rivers is an essential part of the mosquito life cycle. Without these large bodies of water, the valley would have significantly less mosquitoes. The mosquitos need the water for the development of their young. However, the fast-moving water does not provide the conditions that they need for their young. The water must be very calm. Any lake or pond that is large enough to have any sort of waves will be too rough for the larvae. They need water that is perfectly calm nearly all the time. The waves and water movement can easily drown larvae. An excellent habitat for mosquitoes is a flooded plain that is full of grass. The vegetation will keep the water still and provide nutrition for them. The Rivers provide the water, but the mosquitoes can't use it while it is flowing by. When the water breeches its banks and spills into the low-lying areas the mosquitoes can use this resource. Some mosquitoes lay eggs in the soil before the water arrives while others wait to lay their eggs on the water's surface. The larvae hatch out of the egg and need to live in the water while they pupate and develop into

adults. During the summer the larvae will live in the water for about a week. As the temperatures cool off the larvae will spend more time developing. It can take several weeks for them to develop later in the Fall and in the early Spring. The adult mosquitoes will crawl out of the pupal casing and fly away from the water source to feed.

Some of the mosquito sources around the valley are dry, alkaline depressions that fill up with groundwater during the flood season. These temporary pools attract a few different species compared to the less salty water that comes from the river. Also, anywhere that the canals seep through their banks can create a suitable habitat for mosquitoes. It is amazing that an area that receives less than a foot of rainfall all year can produce so many mosquitoes. Some of the worst places in the valley for mosquitos can be the driest, most desolate plains most of the year. The adult female mosquitoes are smart enough to know where the water will be in the Spring, and they can place millions of eggs there on that dry ground.

The larvae can develop in about a week during the summer. As the temperatures drop, the development time increases. The mosquito will then be in the pupal stage for only a day or two, during the summer, depending again on the temperature. This is the stage where they begin the actual physical change from a larva to an adult mosquito. They begin to grow their legs and wings inside this pupal case. They can still move as a pupa, but they cannot eat. If the pupae don't hatch fast enough, they will starve to death in the water. This is a very popular way to control mosquitoes because it still leaves them in the food chain in the water, but it also kills them before they can fly away to annoy people.

Contrary to what many people think, mosquitoes don't feed on blood for their food source. Female mosquitoes are the only ones that bite, and they only need the blood for the protein that's in it. This protein is used for their eggs, and they only need the blood when they are getting ready to lay them. Each of the different species of mosquito also has a different type of animal that they prefer to feed on. The ones that can



spread WNV usually prefer to feed on birds instead of humans. For general nutrition, the adult mosquitoes feed on plants and the fluids that they can get from them. You can see in the picture that the mosquito's abdomen is filled with juice that it extracted from a plant. These carbohydrates keep the mosquito going until they need blood for their eggs.



The larval mosquitoes will feed on any small bacteria or minute pieces of organic material that is in the water. It is very common to find adult mosquitoes in large numbers, hiding in bushes or the wet grass during the summer. They prefer to live in humid areas, and they can feed on the vegetation at the same time.

## Where are the Mosquitoes in Grand Junction?

There are a few common areas in Grand Junction where mosquitoes can almost always be found. Thankfully, there are strong winters that will kill off most of the mosquito

populations each year so the mosquitoes will have to re-build their numbers each Spring. By the 4th of July, their numbers will usually be at their peak, and thus the time to avoid the wetlands by the rivers. There are two common ways for the mosquitoes to survive the cold Winter months. The first is to move into people's attics and crawl spaces. They look for a place that is warm enough for them to survive, but out of the way enough for them to be left alone. The walls and ceilings of the sewer systems are also excellent places to hide. The air is almost always above freezing, and no one wants to go down there and disturb them. The second way of surviving is in the egg. For some species all the adult mosquitoes will die off when it freezes, but they will have laid enough eggs for the next generation to hatch off in the Spring. These eggs can last for years, and not all the eggs will hatch at once. Many will hatch, but some will lay dormant until the next flood or even the next year. This will guarantee the survival of the species. This is an excellent way to persist, and it also makes it very hard to control these mosquitoes. It is also why mosquito control can never eliminate these species. They can reduce them, but there are always more eggs waiting to hatch.

The Grand Valley is kept lush and green by all the irrigation canals that flow from Palisade out towards Utah. These canals usually leak and sometimes the water just seeps through the banks to form a pool. The small puddles and pools that form near the edge of these canals can sometimes last long enough for mosquitoes to develop. It is easy to assume that because the canal is in the desert and flowing that mosquitoes won't be present. However, sometimes the water can breach its banks to create a small mosquito habitat. Just a couple inches of water spread out over a few feet can easily produce tens of thousands of mosquitoes per week. A thousand mosquito larvae per square foot is not unheard of, and if that water lasts long enough, the adult mosquitoes will find it and use it. When the water first spills through the canal banks, the *Aedes vexans* can hatch off right away. However, if the water becomes permanent, the *Culex* and the *Anopheles* can move in to use the

area. We will discuss all of these mosquitoes later in the identification section.

The *Aedes vexans* mosquito is the most common flood born mosquito in the valley. Flood born means that they lay their eggs on dry soil in areas where they know that the water will flood. These eggs are incredible, due to the fact that they can last for three years and still be viable (O'Malley, 2016). When the flood waters fill these areas, a lot of the eggs will all



hatch at the same time. These mosquitoes will all grow up together as one group and become adults at the same time. This will result in incredibly large numbers of mosquitoes hatching off at once. Any area where the Colorado or Gunnison Rivers can spill their banks, probably has *vexans* eggs. The Connected Lakes State Park, shown above, is an ideal spot for these mosquitoes. When the floods come, thousands of larvae can be seen swimming in the waters near the Audubon wildlife area. The Walter Walker Wildlife Area can also become an actual island during peak flow times. When the water recedes, it will create ponds and puddles that become perfect habitats. All the islands along the river have potential to become *vexans* breeding grounds as well. These are just three examples of perfect habitats of these mosquitoes. They can also breed in agricultural fields as well. If the irrigation water is not moved on a regular basis, weekly for example, the field can flood and provide the required water for the eggs. When the water sits on



a poorly graded field, or when it pools at the base, the eggs will hatch. A lot of the alfalfa fields in Fruita are over watered, and that is why the mosquitoes

get so bad after each cutting. A week of permanent water is all that a *vexans* needs to thrive.



The *Culex* mosquitoes are the ones that can transmit WNV, and these mosquitoes prefer permanent water sources. There are two main species here in Grand Junction, *C. tarsalis* and *C. pipiens*. This means that they won't be found in the temporary pools down by the rivers. They will be found in permanent water sources, like ponds and animal watering troughs. These mosquitoes can also use storm drains and even

small buckets of water in people's backyards. Any water that is undisturbed for several weeks will become a suitable habitat for these mosquitoes. The more organic and putrid the water, the better it is for these larvae. Since they are so opportunistic in their choice of habitats, this is the most common genus of mosquitoes in the Grand Valley. They can be found in almost every pond from Fruita to Palisade. Golf courses are a great example of areas that provide a high number of ideal habitats. Cattail plants can provide enough protection from the wind and waves to help them survive in the ponds. The *Culex pipens* prefers the sewer water of the storm drains. They like water that is more organic compared to what the *tarsalis* prefer. They can still be found in the same general areas, but it is more likely to find *pipiens* in the disgusting sewer water.



Certain mosquitoes like *Ochleratatus dorsalis* and *Anopheles freeborni* prefer a combination of these different habitats. The adult females will lay eggs in the ponds that can form after the river floods. They will also use swamp water when it is available. These mosquitoes don't prefer water that is as foul as what the *Culex* prefer, but they still need high organic material to feed on as larvae. In Grand Junction, these mosquitoes can be found breeding in ponds that are more natural and further away from humans.

# What Do Mosquito Larvae Look Like?

Almost everyone knows what a mosquito is. Their annoying sound is the first sign that something is coming your way. Then they land and start looking for a place to bite you. We can squish them and try to repel them with Tiki Torches, but all these methods can only do so much. It is quite difficult to control adult mosquitoes and kill a significant number of them. The easiest way to control mosquitoes is by going after them in the water. The larvae are all contained in one area, and by simply getting rid of the water, the mosquitoes will be eliminated. Removing the water is not always possible, but simple steps can be taken to kill the juvenile mosquitoes.





First, we need to know what larval mosquitoes look like. These insects go through complete metamorphosis which means that the larvae turn into a pupa and then they change into an adult that looks nothing like the larvae. When they go into their pupal stage, they dramatically change by growing legs and wings inside their case. The larvae are little wiggling worm-like insects that swim through the water. They have a large head that hangs downward, and their tails are little siphon tubes, used for breathing. Even though they live in the water for the first week of their life, they do not have gills. They must stick their siphon tube through the surface of the water to get some air. The surface tension will then hold them there, and they can just hang around and eat bacteria. The larvae can hold their breath for a while if the water is disturbed. The movement of the water can frighten them, and they will swim down to the bottom to hide.



The first instar larvae are incredibly tiny. They are called “pin-heads” because they are about that size. It is very easy to miss them, and most people won't see them. By the time that they grow into their final, fourth stage, they are quite a bit bigger (pictured above). A large fourth instar can be over a quarter inch long. These “wigglers” can be spotted with the

naked eye quite easily. The fourth instar will then turn into a pupa. A pupa is sometimes called a “tumbler” because they are more of a ball shape (see previous photo). This “ball” has a tail, and they will roll away from anything that scares them. The pupae still need to breathe oxygen like the larvae, but they do not eat. The siphon tubes are located on the head of the pupae, and there are two instead of just one like the larvae. These tubes are pushed through the water’s surface, and the pupae can just float along all day. When the adult is developed, the pupae will go to the water surface, and the adult will begin to break out. The adult mosquito will stretch its long, brand new legs and step out onto the water's surface. After a couple minutes of letting its whole body stretch and dry off, the mosquito will fly away to begin its life.

It is hard to identify mosquito larvae to the species level. They have super tiny hairs on their siphon tubes that need to be looked at under a microscope to determine what species it is. Even professionals can struggle with identification. The easiest way to make an educated guess about the larvae that you find is to look at the instars. If every larva you see appears to be the same size, then the larvae all hatched at once. This means they are probably an *Aedes*, flood water mosquito. The eggs all hatch when the water comes in, so all the larvae grow up together at the same time. If you can see all four instars plus maybe even pupae, then you are probably looking at a permanent water source mosquito. This is likely a *Culex* mosquito. All the different adult *Culex* mosquitoes are laying eggs in that water each day, so different eggs are hatching every day. A pond that is left untreated can produce thousands of mosquitoes per day. A massive flood might produce tens of thousands of mosquitoes at once, but that water usually dries up and the mosquitoes leave.

Looking in your backyard for larvae is a great way to reduce the mosquito problem. They are opportunistic little insects and if they don't have to fly far, they won't. If you have water for them to breed in, and they can feed on you for their blood meals, then they might not want to leave your yard. Reducing the standing water by tipping over wheelbarrows and



plant saucers is great for getting rid of the *Culex*. Fixing broken sprinklers and leaky gutters can help stop the random little floods to help get rid of the *Aedes*. Anything you can do to move the mosquitoes further from your yard, will result in fewer in your area. They will usually attack the first animals they see, and almost none of the mosquitoes will go out and actively look for humans.

## Mosquito Identification Guide

The next section of this booklet will provide a guide to identifying the mosquitoes that are bugging you. There is a magnifying glass at the end of this book that can be used to help you identify your mosquitoes. Mosquitoes can be hard to manipulate, and they never hold still long enough. The best way to correctly identify your mosquito is to capture them, carefully, and place them in the freezer. After a few hours, or overnight, the mosquito will die and then you can look at its features at your own pace. If you just put them in the fridge, there is a good chance that they won't die, but just go into a state of dormancy. Then when you are trying to look at them, they will wake up and fly away. These mosquitoes will also be very fragile. You will need to handle them carefully. Tweezers are very helpful to position the mosquito in the best place to view their features. Each species of mosquito has a few unique characteristics that can help you figure out what you are looking at. Remember, there are over twenty species here in the valley, and this key only covers seven significant species. The species covered are:

***Aedes aegypti***

***Culex tarsalis***

***Aedes vexans***

***Culex pipiens***

***Anopheles freeborni***

***Ochlerotatus dorsali***

***Culesita inornata***

Female mosquitoes are the best for identification. Male mosquitoes look very different, and they have different features that we will not cover. The easiest way to determine if you're looking at a male or female is to look at the antennae. Males have very large, bushy, almost feathery antennae. The male mosquito is on the right, and you can see how plumose its antennae are compared to the female.



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First is the *Aedes aegypti*. This mosquito is incredibly rare in Grand Junction. There has only been one found in the area, ever. However, they are known to carry numerous diseases including: Zika, Dengue, Chikungunya, and Yellow Fever (ECDC, 2019). Since these mosquitoes are so medically important, it is critical to keep looking for them. They are commonly found in Utah, including Moab, and the only one in the valley was found in Fruita. These mosquitoes are quite easy to identify. They have a few extremely unique attributes that make them stand out. This mosquito is also unique in that fact that it prefers human habitations for reproducing. They will lay eggs in rain gutters, bird baths, plant saucers, and even in pieces of trash around a house. Any dark, wet place around a home will work for these mosquitoes.

- Scientific Name: *Aedes aegypti*
- Common Name: Yellow Fever Mosquito

- **Normal Range:** This is a tropical mosquito that inhabits most of Asia and Africa. It is also found in much of Central and South America as well. Recently, it has begun to invade the United States. As of 2005, it was only found in the South around the states that touch the Gulf of Mexico (Darsie, 2005). It has become a permanent mosquito in Nevada, California, and Arizona after that. It is currently adapting to different climates and has moved into Nebraska and Utah in the past years. In 2019, one single adult female was found in Fruita. This is the first time that this mosquito has ever been found in Western Colorado. It was found in a shipment of used tires in Pueblo, Colorado in 2010, but it never made it to the West Slope.
- **Local Habitat:** One female has been found in downtown Fruita, Colorado.
- **Flight Range:** This mosquito is not known to fly very far at all. It will sometimes never leave the backyard where it hatches.
- **Preferred Hosts:** This mosquito is unique in two ways. The first is that it prefers to feed on humans as its main protein source. The second, is that it will also bite people during the day. Most mosquitoes hide during the day and come out at sunset. This mosquito will attack people during the heat of the day in their own backyards.
- **Medical Significance:** This mosquito can transmit numerous diseases. It is one of the deadliest mosquitoes in the world due to this fact. Even its common name, the Yellow Fever Mosquito, should tell you how important it is. It caused real issues in 2018 when the Zika virus came to the United States. This was the main mosquito spreading the disease in Florida.
- **Identifying Features:** This mosquito is very easy to identify because of the lyre shape on its thorax. Their abdomen has the shape of this ancient musical instrument. No other mosquito has a pattern like this on its back. The lyre is usually white in color while the

rest of the mosquito is dark brown to black. The contrast makes the pattern very visible.



(Zettel 2019)

This mosquito also has a beautiful speckled, black and white pattern all over its body. The legs and proboscis both have a “spotted” look to them. There are other mosquitoes in the valley that have some spots on their legs or proboscis, but none of them have as many as the *aegypti* have.



(Zettel 2019)

Since this mosquito is not native to Grand Junction, and it can carry so many diseases, it is very important to report them when found. The county health department is always looking for more of them, and they want to help make sure that they do not get established here. Everyone can help control this mosquito. Since it normally lives its entire life in one neighborhood, or even a single backyard, it is hard to monitor

for them. That is why everyone needs to help look for them. Nobody wants a new mosquito in town that can carry so many diseases, and with everyone's help, we can keep it out.

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The *Aedes vexans* mosquito is the most common mosquito in the Grand Valley. These mosquitoes are rarely known to carry human diseases, but they can carry dog heartworm in Grand Junction quite easily (O'Malley, 2016). When you are outside and your legs are attacked by lots of mosquitoes, that is probably a *vexans*. They do not fly very high off the ground, and they can attack in large numbers. These mosquitoes are also very plain looking. They do not have any significant traits that make them incredibly unique, but they can be identified relatively easily.

- Scientific Name: *Aedes vexans*
- Common Name: Inland Floodwater Mosquito
- Normal Range: When it comes to North America, the *Aedes vexans* mosquito has the biggest range of the mosquitoes in this booklet. These mosquitoes can be found all the way from Florida to Alaska, and everywhere in between (Darsie, 2005). They have adapted to the hot Texas Summers and the cold Canadian Winters. They are found in every US state except Hawaii.
- Local Habitat: These mosquitoes are found all along the river floodplains as well the agricultural areas. The adult females know where the waters will flood, and this is where they lay their eggs. They lay hundreds of eggs individually on the soil, and then the eggs will wait for the waters to come. The eggs are also very resilient, and they can wait up to three years for water to arrive (O'Malley, 2016). When farmers over water their fields, it makes a good home for *A. vexans* as well. When the rivers are especially full, they can flood into areas that have three years' worth of eggs in the soil. This can cause millions of mosquitoes to hatch off at once.

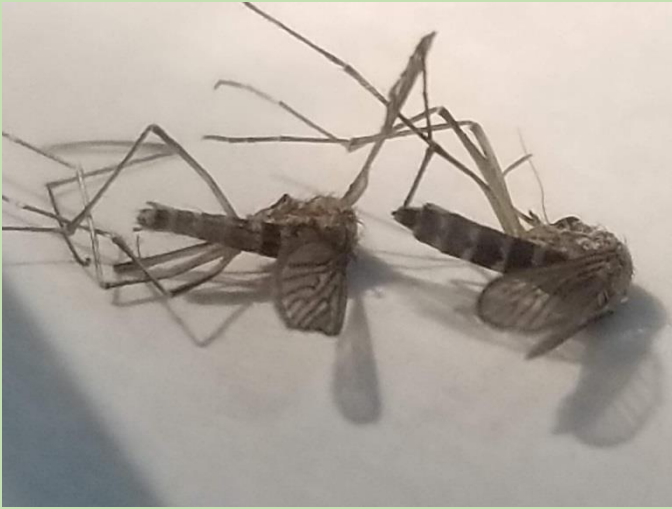
- **Flight Range:** *A. vexans* are incredible fliers. When they are desperate for a blood meal, they can fly ten miles in their search (O'Malley, 2016). Most of the Grand Valley is within ten miles of the rivers, and this means that these mosquitoes can cover our entire area. They are opportunistic and they will usually attack the first mammal that they come upon.
- **Preferred Hosts:** They prefer larger mammals. This can mean humans, but it also means that they will feed on livestock and deer size animals.
- **Medical Significance:** The main disease that these mosquitoes carry in our area is dog heartworm. This disease does not affect people, but it can be fatal to dogs without treatment.
- **Identifying Features:** If you see larvae in your backyard, you can look at what stage they are in. One unique feature of some species, including *Aedes vexans*, is that all of the larvae hatch at once, so all of the instars will be the same. This is a very easy way to separate these nuisance mosquitoes from the more medically important species, like the *Culex*. Because *Culex* will all hatch at different times, so the instars will range from stage 1-4.

The adult *Aedes vexans* are quite small overall, and they usually attack in large numbers. This is the most common mosquito to get swarmed by. Tens of thousands of these mosquitoes can be trapped per night when the rivers are flooding. The picture on the next page, is over 150,000 adult *vexans*.

*Vexans* have very pointed abdomens that can be used to help identify them. Since they are so small, it can be hard to tell exactly what a “pointed” abdomen actually is. However, *Culex* mosquitoes have a very rounded abdomen, so when they are compared side by side, it is very easy to tell the difference. The *vexans* is on the right-hand side, and it is easy to see that their abdomen ends with a sharp point. The *Culex* on the left has a more rounded appearance.







The abdomen pattern of the *vexans* mosquito is also a great tool to help identify them. The scales are brown and black, and they form a very nice scalloped pattern. The black scales form a nice shape that is the same on all the individual mosquitoes. It starts out even on the sides of the mosquito and slowly peaks in the middle of the abdomen. This means that the white scales will form a “B” shape.

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The *Anopheles freeborni* mosquito is actually a very beautiful mosquito, and it has a single unique feature that makes it very different from all the other mosquitoes in the valley. The genus *Anopheles* is the main vector of Malaria in Africa and around the World. It is a different species than what we have here, but it does mean that *A. freeborni* does have the potential to spread the disease, if it was ever brought to Grand Junction. There are relatively few numbers of this mosquito in our area. The most common part of the valley to find it is around 22 and L roads. It is found all over Grand Junction, but there seem to be more in the more rural, Northern part of the valley.

- Scientific Name: *Anopheles freeborni*
- Common Name: Western Malaria Mosquito
- Normal Range: The *Anopheles freeborni* mosquito is limited to just a few states in the Western US and the Southern tip of British Columbia. It is found from the middle of Colorado, west to California (Darsie, 2005). This mosquito prefers to be mostly west of the Rocky Mountains.
- Local Habitat: The highest concentration in the valley, which is still quite low compared to other species, is between Grand Junction and Fruita near the Highline Canal. They prefer very natural ponds that have plenty of cattails and algae. The algae help the larvae survive and hide from predators.
- Flight Range: These mosquitoes do not fly very far compared to some of the other species in this book. They usually won't go farther than five miles per night in search of food. Also, since they are so rare around here, they are almost never seen in urban neighborhoods.
- Preferred Hosts: These mosquitoes prefer to feed on mammals and humans. They will actively seek humans if they are within their flight range. In Africa, humans are the main target of these mosquitoes, and this is one reason why they are so good at spreading Malaria.

- Medical Significance: These mosquitoes can carry Malaria, but that is nearly impossible here in the Grand Valley.
- Identifying Features: The *Anopheles* larvae are the only mosquito larvae that will lay horizontal on the water surface. All other species will hang vertically from the surface of the water downwards. This also means that the *Anopheles* larvae take a little longer to develop, because they are not getting as much nutrition. A larva that hangs vertically has more access to the bacterial and organic matter in the water; the *Anopheles* larvae only has access to the food at the water's surface. The adult mosquitoes in the *Anopheles* genus have unique palpi that makes them stand out from every other mosquito in Grand Junction. The palpi is a little sense organ that is on the face of all mosquitoes. It is next to the proboscis, the part that bites you, and they help the mosquito identify their target. Their palpi are as long as their proboscis, which makes them very easy to identify. It makes them look like they have three proboscis on their face instead of just one. They also have unique scales on their wings that give them an iridescent quality.

You can see that the *Anopheles* on the left has a very long palpi right next to its proboscis that are the same size as it. While the *tarsalis* on the right side has much smaller palpi that are significantly shorter than its proboscis. The *Anopheles* is the only species in the valley that has this feature. It is the only thing you really need to look for when it comes to identifying the *Anopheles* in Grand Junction. The black and white picture really highlights the difference between the two species. Again, the *tarsalis* is on the right with the much shorter palpi. The *Anopheles* mosquito is one of the easiest to identify if you look for this feature.





These mosquitoes also have very pretty wings that can be used to help with identification. They are iridescent in the light, and they have some spots on them. These spots can be seen easily with a magnifying glass or even sometimes with the naked eye. There are also no other mosquitoes here in Grand Junction that have spots like this on their wings. The spots can be hard to see on damaged wings, and sometimes the wings get destroyed when the mosquito is being captured. It is easiest to just look at the papli to determine what type of mosquito it is.

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The *Culesita inornata* mosquito is a massive mosquito that is dramatically larger than the other species in the valley. It is not nearly as big as a Crane Fly, but compared to other mosquitoes, it is nearly twice their size. These mosquitoes live in the swamps and permanent water sources of the valley. When you think of the cliché mosquito habitat from the movies, this is where the *Culesita* live. The mosquito larvae can be found year-round in these sites, and they tend to be some of the first species to hatch off in the Spring. There is not much information known about these mosquitoes, but since they are so large, they are worth identifying.

- Scientific Name: *Culiseta inornata*
- Common Name: Winter Marsh Mosquito
- Normal Range: The *Culiseta inornata* mosquito has a very large range. This mosquito is found throughout the entire continental United States, except Alaska and Maine, and it covers most of Western Canada as well (Darsie, 2005). It has adapted to most climates and locations quite well.
- Local Habitat: This is the typical mosquito that you find in swamps. In Grand Junction, it breeds around the permanently wet areas like the swamps and ponds around Corn Lake State Park. The Letha Jean Stassen Wildlife Area is also an excellent habitat due to the swamps, from the backflow of river water.
- Flight Range: These mosquitoes are not known to fly very far, usually just a few miles at the most. They can usually find their preferred hosts near where they hatch off.
- Preferred Hosts: These mosquitoes don't attack humans as often as other species, but since they are so large, they are noticed more often. They will feed on most mammals that live around their natural habitats. This can include pets, deer, raccoons, and other mammals to name a few.
- Medical Significance: These mosquitoes can carry WNV, but they are not known to be excellent vectors of it. They are better at carrying Eastern Equine Encephalitis, but this disease is very rare in the Grand Valley. It can affect humans, but like the name implies, it is primarily a horse disease.
- Identifying Features: Size. This mosquito is one of the largest in the valley. It is not nearly as big as a Crane Fly, but when compared to other mosquitoes, it is much larger.

The *Culiseta*, on the right side, is so much larger than the *Culex pipiens* in the photo. There are not very many other defining characteristics about this mosquito. There are a couple species of *Culiseta* in Grand Junction, but the *inornata* species

has completely black legs. Other species have different striping patterns on their legs that set them apart, but this species is all one color. They have rounded abdomens like the *Culex*, but their bodies are darker in color. They are more of a dark gray to black, compared to the golden color of the *Culex*.




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The *Culex tarsalis* is the second most common mosquito in Grand Junction. The *Culex tarsalis* and *pipiens* make up the most common genus of mosquitoes in our area. This mosquito will only use permanent water sources for laying their eggs. They completely avoid the quick floods from the rivers, unless the water sits for a few weeks and becomes a permanent pond. They will lay their eggs in one large raft. This raft can contain hundreds of eggs, and they will hatch within a day. It can be easy to identify *Culex* larvae, since different adult females will lay eggs every day in the pond, there will always be different stage larvae.

The *Culex pipiens* mosquito is very similar to the *tarsalis*. They prefer very organic and nutrient rich ponds to lay their eggs on. A lot of the females will seek out storm drains. Since Grand Junction is such a dry area, people over water their property and the water in the storm drains can sit for months. The irrigation water from people's lawns can keep just enough

water on the bottom of the drain for the larvae to survive the hot Summer months. When a large storm comes through town, the larvae will be washed out and killed from the movement of the water.

- Scientific Name: *Culex tarsalis*, *Culex pipiens*.
- Common Name: *Culex tarsalis* = Western Encephalitis Mosquito. *Culex pipiens* = Northern House Mosquito
- Normal Range:
  - The normal range of *Culex tarsalis* is most of North America (Darsie, 2005). It avoids the North East part of the United States, but it can be found from Canada down to the US and Mexico border.
  - The normal range of *Culex pipiens* is the northern half United States from coast to coast (Darsie, 2005). It does not usually go south into Texas or very far north into Canada.
- Local Habitat: These mosquitoes are spread out all over our valley, but they are more concentrated in the urban areas. *C. pipiens* prefers to use storm drains and sewer water for their breeding grounds, so they are in the most densely populated parts of town. *C. tarsalis* will use almost any pond that is available. If there is protection from the wind and waves, the pond water will provide a good home for the larvae.
- Flight Range: Both mosquitoes have very short flight ranges. It is widely considered that they will fly less than a mile in search of a blood meal. Since they feed on birds primarily, they can usually wait for their meal to come close to them. They can also feed on young birds that are still in the nest. They can find these nests easily in the trees around the water source where they are hatched.
- Preferred Hosts: *Culex* mosquitoes prefer birds for their main source of blood. These mosquitoes can be found higher in the trees waiting for their prey. They will bite people when they have an opportunity, but they will seek out birds first. This is one reason why *Culex* can

spread WNV so easily. The virus needs birds to develop and amplify in nature. When WNV is especially high in the valley, many of the Crows and Magpies will die off. After the adult female *Culex* bites a bird with the virus, it can pick up the disease and then it can transfer it to a human.

- Medical Significance: *Culex* mosquitoes are excellent vectors of West Nile Virus. They overwinter as adults so the virus can stay active through the entire year. These adults that live over the winter can spread the virus to birds in the Spring, and the cycle will begin again.
- Identifying Features: One of the easiest ways to tell if the larvae in your yard are potentially *Culex* species is to look at the different stages and see if they are all there. The eggs are laid in large rafts that all stick together. These rafts are quite tiny, less than a quarter of an inch long, but they are visible to the naked eye.

The adults of both species look like each other. Both have abdomens that end with a very rounded shape. They are also golden brown in color. The *tarsalis* does have unique striping on its legs and proboscis, that the *pipiens* does not have. Every *tarsalis* has a broad white stripe on its proboscis that is very prominent. *Pipiens* have a slightly different pattern on their abdomens when compared to the *tarsalis*. Their shape is more of a crescent compared to a block, but they can look similar. If you only have one mosquito to look at, it is best to look at the stripes for identification.

This first picture on the right shows the stripes on the legs. The *tarsalis* is on the left and you can see the white stripes on each joint. The *pipiens* on the right has completely black legs.





This previous photo shows the difference between the two proboscises. The *tarsalis* on the left has the white stripe again right in the middle. The *pipiens* on the right has a completely black proboscis. The abdomens can be a little confusing when looking at these two mosquitoes, but the stripping will always be a useful tool for identifying them.



The abdomen of this *tarsalis* can be somewhat useful for identification. The *Culex* have a prominent golden, brown color, and the stripes on their back are quite striking. The separation between the dark and light bands makes them stand out. The pattern on the *pipiens* is similar, but it is not quite as bold as the *tarsalis*.

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The *Ochlerotatus dorsalis* is generally an early season mosquito. When the temperatures begin to warm up above freezing, this mosquito will begin to develop and hatch off. It will be one of the first mosquitoes to come out and bite people in the Spring. The freezing temperatures can of course kill the adults, but the warm temperatures in April are usually high enough to support them. They are sometimes called the Salt Marsh Mosquito, and this means that they prefer the more alkaline habitats that we have here in Grand Junction. A lot of the pools that we have along the River Front Trail between the

Redlands parkway and the Broadway Street bridge are very alkaline and when the groundwater fills these up, the *dorsalis* will begin to hatch. They are also very aggressive biters. You will notice when these mosquitoes are attacking you. *Culex* can be very sneaky and more delicate when they land on you, but *dorsalis* will bite quickly and with some force. The actual puncture from their proboscis hurts more than other mosquitoes because they attack so swiftly.

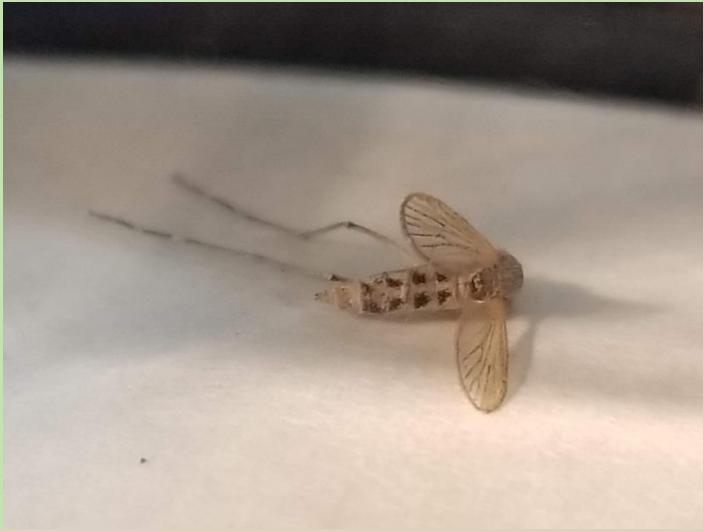
- Scientific Name: *Ochleratuts dorsalis*. (This mosquito used to be called *Aedes dorsalis* before the year 2000. Genetic testing was done, and it was determined that they were a completely different genus, not just a different species.)
- Common Name: Summer Salt Marsh Mosquito
- Normal Range: The *Ochleratuts dorsalis* mosquito is found throughout most of the United States and Southern Canada. It can be found from California to Vermont, but it is not found in the warmer Southern states, south of Kentucky (Darsie, 2005). It can occupy most areas, except the hottest and most humid states.
- Local Habitat: The alkaline pools along the rivers that fill with groundwater. They can also be found near the desert above the Highline Canal. These marshy pools can produce numerous mosquitoes that can fly South into town.
- Flight Range: The *Ocheleratus dorsalis* mosquito is also an incredible flier. They can cover ten miles in their search for food or a breeding site.
- Preferred Hosts: These mosquitoes like to attack larger mammals. This can include livestock or even wild animals like deer. Humans also fall into this category. They can be quite ferocious when hundreds come out of the grass to attack a passerby.
- Medical Significance: Thankfully, these mosquitoes are not known to be vectors of any major diseases. It is theorized that they can carry a few forms of Encephalitis, but the mosquitoes around here are not known to spread anything.

- Identifying Features: The *dorsalis* mosquito can usually be identified without any sort of magnification. They have a very unique spot pattern on the back of their abdomen that really stands out. They also have very gray scales on their body. Most of the mosquitoes in Grand Junction are brown or black in color, so a completely gray mosquito stands out.

The easiest way to spot a *dorsalis*, is to look at its abdomen. The spots are very unique, and they can be seen with the naked eye. There are usually 8 black spots that are all separated by gray scales.



The only species in the valley that resembles the *dorsalis* is the *Ochlerotatus melanimin*. This mosquito also has black spots and gray scales, but the black spots seem to almost touch each other. They do not have distinct separations like the *dorsalis* does. The *melanimin* is on the left and the *dorsalis* is on the right. The *dorsalis* has more of a uniform polka dot pattern on its back.



The legs of this mosquito are also striped. Just like other mosquitoes, their legs are very long compared to their body, and they have black and white stripes all along them. The legs are very delicate, so be careful not to break them off when capturing this insect. The white stripes occur around the joints on the legs.

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# Other Common Insects in Grand Junction

There are many other interesting insects here in Grand Junction. We are going to talk about just a few of them in the remainder of this booklet. Many of them are misunderstood, and some are beneficial insects that can help us out. All of them are unique and can be found around town, if you know where to look. One of them is an arachnid and more closely related to spiders. However, there are always many questions about them, so some more information might be helpful.

Many insects are misunderstood, and a lot of people think that almost every insect, except a honeybee, is harmful or annoying. Insects do so much for humanity that the world would cease to exist as we know it without them. Some of the ones that we will talk about are considered pests by people, but they all have at least one aspect that helps humanity. Even the flies and mosquitoes that attack us are responsible for helping keep our environment cleaner. They clean up a lot of the dead plant and animal matter that is all over in nature. Without these flies, the world would be covered with dead organic matter. All these insects that feed on this decaying matter, need to be kept in check as well. This is where the predator insects that we will talk about come into play. These generalist predators are very useful to keep the number of scavengers and plant feeding insects at acceptable levels. All of them work together in an excellent symbiotic relationship.

## **Crane Fly**

The first non-mosquito insect that we will cover is the Crane Fly. These flies are not very nimble, and they are usually seen bumping into walls and fences when they fly. Their large size and clumsy flight patterns make them stand out. These very large flies are often confused with mosquitoes because they look so similar. They have the same general shape when it

comes to their wings and legs. However, they are not able to bite people at all. There are many rumors that these flies will eat mosquitoes. This is not true either. They do not feed on other insects for food. Their mouths are not designed for biting animals or people. The adult and larval crane flies just feed on plants. The adults are not usually considered a pest insect, but the larvae can become a real problem. The adults can be annoying, but they won't do any harm to anyone.

The larvae can live in freshwater or in very moist soil. When they live in wet lawn soil, they can harm the grass and the roots of other small plants. Normally, the larvae will feed on algae and other decaying organic matter. This means that the larvae can be very beneficial when it comes to cleaning up areas. The dead matter will be broken down and digested by these "leather jackets" as they are sometimes called. They get this name from their thick skin and brown color. If the larvae feed on already dead matter, and not peoples landscape plants, they are a welcome insect in the valley. When they infest lawns, they will cause the grass to die and become a pest. Grub control chemicals can then be used to help remove them.

Thankfully these flies do not pose any adverse health effects for people. They are incapable of biting people in the first place, and they do not carry any diseases. Their larval form may cause aesthetic damage to people's properties, but that is all. There is no need to worry if you occasionally see this fly around your home.

It is easy to identify these insects when compared to other flies. There is nothing that is as large and long legged as the crane fly. When these flies land on a wall or other surface, their legs spread out over a couple inches wide. They also have thick bodies compared to their thin legs. Their wings and body are tan to golden brown in color. This color can really help them hide on tree trunks or on dead grass. Just because they are quite large, it doesn't mean that they can't hide. They are poor fliers, and that makes them easy to see, but when they sit still, they can blend in.



The long legs of this fly are very fragile. You will often see them missing a leg or two. When they are trying to land or feed, they can accidentally break off part of one of their legs. Strong winds can also blow them into objects that can damage them. Even though these flies have the same general shape as a mosquito, you can see that they are dramatically different in size. There is not a single mosquito in the Grand Valley that can compare to the size of the Crane Fly. Even the largest *Culesita* is dwarfed by this fly.

### **Deer Fly**

The deer fly is one of the most annoying insects in the whole Grand Valley besides the mosquito. These flies have a very painful bite, and they can also spread diseases. The deer fly species that we have here in Grand Junction are in the genus *Chrysops*. There are hundreds of species in this genus, but the genus is quite easy to identify from their unique triangle shape.



They are not quite as big as horse flies and they are more of a brown color instead of jet black. The deer fly is also known to live around wetter environments, like down by the rivers. Their larvae are aquatic and live in the same habitats as the mosquitoes of the valley. The adults also feed on nectar and plant fluids just like the mosquitoes. Our blood is only required for the eggs of pregnant females. When she is ready, the female can lay a large cluster of eggs, up to 800, by the water's edge. When the larvae hatch, they will move into the water and be fully aquatic. Usually the fly will overwinter as a larva, and then they will pupate in the Spring. As the temperatures warm up, the adult fly will emerge and take off.

The deer fly has a bite that is much more painful than a mosquito because they do not pierce the skin directly. Instead, they will slice open the skin and drink the blood that spills out. A mosquito will only take as much blood as they can use, and a deer fly will cause extra bleeding. Since they don't pierce the skin with their proboscis, they do not inject diseases into our bodies. They carry the disease on them and in their saliva and feces. People get the disease by rubbing this into the wound that the fly created on their skin. When you slap the fly, you can move the germs that way, or when you start to scratch the bite, you can move the disease that way also. It is best to wash the area to help reduce the spread of diseases. They are excellent vectors of Tularemia as well. This is a disease that mostly affects rabbits, but the fly is a great vector of spreading it between humans and rabbits. There are several horrible diseases, e.g. Loa Loa, that these flies can transmit in Africa, but they are not present here.

These flies can be identified by looking at a few specific features. However, if there is one biting you, it is better to just squish it and get out of there! If you can catch one without getting bit, then there are a few defining features. When they are sitting still, their wings form a nice triangle shape with a dark colored stripe that runs across them. They are usually a yellow to brown color, unlike horse flies which are nearly all black. Also, horseflies are much larger than a deer fly. These flies are usually less than an inch in length.



The eyes of deer fly are also very pretty to look at. They are usually multi-colored, and they can tell you whether you are looking at a male or female. The eyes of the male deer fly will touch in the middle, and the eyes of the female won't touch. There will be a gap right along the middle of their face if it's a female. The antennae that are close to the eyes are also very stout. This is a feature that can aid in the identification. They look like spines that are pointing straight out in front of the fly.



These flies are not very beneficial overall, besides the larvae eating decaying organic matter, they are more of an annoyance. It is important to protect yourself from their bites since they can carry diseases just like mosquitoes. Bug spray with Deet is not very effective to keep these insects away. It will deter them a little bit but not enough. They like to hang out in the same swamp like areas where mosquitoes are found, and it is best to just avoid these areas if possible.

### **Milkweed Beetle**

The milkweed beetle is a very common site here in Grand Junction. There are little patches of milkweed all over the place, and these beetles are usually present on the plants. Most insects avoid the plant altogether due to its toxicity, but these beetles have found ways to use it to their advantage. The adult beetles can also bite the plant in the right place to prevent it from secreting the milky substance all over them as they feed. They can bite the veins of the plant, and then they will feed further out on the leaves. The sap will not be able to get to them since they damaged the leaf closer to the stem.

The larvae will also eat the roots and stems of the milkweed plant. When they are doing this, they can sequester some of the toxins from the plant and store them in their body. This will make them poisonous to anything that is trying to eat them. Birds and other insects will avoid them and let them live. They are safe to touch, but they are not safe to eat. If the milkweed plant is considered a weed on your property, then these insects are beneficial. The milkweed can be great for butterflies and other insects, but a lot of farmers try to get it out of their fields. Since it can be toxic, they do not want it around their livestock or alfalfa fields.





Photo by Thorpe, L.

These insects are also very easy to identify. They are usually found on milkweed plants, and they are bright red. This color contrast makes them easy to spot. The summer months can get quite hot, and sometimes it is easier to find the beetles on the underside of the milkweed leaf looking to avoid the heat.



Their family, *Cerambycidae*, is the long-horned family of beetles. This means that their antennae are very long compared to their body. You can see in the pictures that their antennae



are almost longer than their body. Their antennae also attach to their head in their middle of their eye. This makes their eyes split into two distinct parts. This can be seen easily in the picture on the previous page. That is their eye above and below the antennae. The specific species that we have in Grand junction is *Tetraopes tetraphthalmus*. It is common around the

country feeding on different types of milkweed plants.

If you are not a fan of the milkweed plant, then these are very beneficial insects. Overall, they are not a pest, and they never need to be controlled here in Grand Junction. Look for them the next time you are out and try to find some on a milkweed pod. They are quite beautiful and fun to watch as they go about their day.

### Jerusalem Cricket

The Jerusalem Cricket is a unique insect that most people don't even know about. They are almost impossible to miss once you see one though. These crickets live in the desert under rocks or under the soil. They are not seen on the soil surface very often. Their front legs are built for burrowing and digging throughout the soft earth in search of decaying organic

material to eat. They will eat other insects as well if they have a chance to catch one. Usually they come across other insects by accident while burrowing in the soil. Since they can eat other insects, they have strong jaws for attacking. These jaws can make a person bleed if they bite you, so it is best to not pick one up with your bare hands.

These crickets are common and native to the Western half of the United States and down into Mexico. They are not from Jerusalem like the name implies, but it is thought that the name came from an inaccurate translation of several Navajo words. The early settlers of the West took the names and translated them the best way they could, but the misinterpretations stuck. Now the Jerusalem name is common. The species that we have in our area is *Stenopelmatus Navajo*. There are several other species in the U. S., but this one is the most common here. These crickets are only related to the normal crickets that you think of in name as well. They are both in the same order, but they are in different families. True field crickets are in *Gryllidae* and these crickets are in the family *Stenopelmatidae*. They do play a song to attract mates and communicate with others like other crickets do. However, their Jerusalem cricket has a much deeper sound, and it sounds more like drumming than chirping.



These crickets are very easy to identify. They are tan in color and have a very large head. Their abdomen has several

black stripes that run laterally across it. There are other families of crickets that are somewhat similar in color and shape, but these Jerusalem crickets have some defining characteristics. If you want to catch one to identify, it is best to look outside at night. They can be found during the day beneath rocks and logs. It is nearly impossible to just randomly dig one up out of the



soil. Be careful because this is the same place that scorpions and other venomous arthropods might be hiding. It is better to just accidentally find a Jerusalem Cricket, than to get hurt while out looking for one. The head on these crickets is also very interesting to look at. They have large eyes and a large beak like mouth that really stands

out. Most crickets have a head that looks much smaller than their abdomen, but Jerusalem crickets' head appears to be the same size. Their entire body of a living specimen looks soft as well. They have a strong exoskeleton like other insects, but their general shape gives them a softer appearance. The one in the pictures has been preserved, so it has dried out and become more brittle.

Jerusalem crickets' size and general appearance make these unique insects. It can be fun to go look for them and add them to your insect collection but be careful not to get bit when picking them up. They are not to be feared, because they should

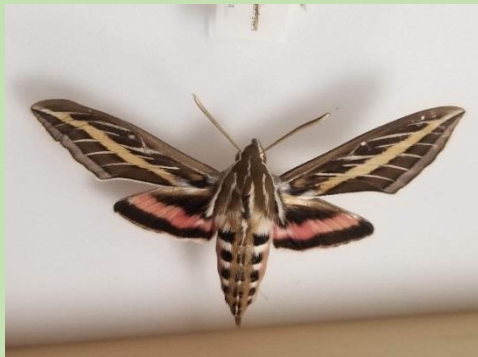


be recognized as a beneficial insect. They will feed on dead matter and help clean areas by removing this detritus.

### **Sphinx Moth**

The Sphinx moth is a beautiful insect that feeds on flower nectar. These moths are so large that they are often confused with hummingbirds. They are sometimes even called hummingbird moths or hawk moths. They use their very long proboscis to drink the nectar, which adds to their hummingbird like appearance. The larvae can be a real pest depending on the species. The tomato hornworm is in this group of insects, and they can destroy all of an individual's tomato plants. The adults of this species that we will cover here are not a major pest on agricultural crops. This species looks dramatically different compared to these destructive pests. The caterpillars of the common Sphinx Moth in Grand Junction can cause minor damage to plants, but it is not a major pest. The caterpillars can look like tomato hornworms, so it is important to analyze them closely.

The species *Hyles lineata* is very common here in the Grand Valley. Its common name is the Whitelined Sphinx. Its bright colors and size make it quite noticeable. They are crepuscular, which means that they are the most active during dawn and dusk. They are often hiding during the day, and they can occasionally be seen at night right after sunset. Since they are sometimes active at night, it makes it a good time to capture them. One of the best ways to attract them is with a white sheet and a blacklight. The light will make the sheet glow, and the moths will be strongly attracted to it.



The adult female will lay her eggs on a plant that will provide enough nutrition for the larvae. They prefer evening primrose, elm trees, or even apple trees. The larvae usually don't eat enough of the tree to hurt it or kill it. The larvae can feed for months before they climb down off the tree to pupate. They will dig a small hole in the soil to pupate underground. This will provide them a little protection during this time.

Identifying these moths is possible due to their color patterns on their wings. Their top wings help them hide during the day by acting like a sort of camouflage. Their bottom wings have a beautiful light red/pink color that is usually only visible when they are flying. Their wings can easily be over two inches in length from tip to tip. When the moths are at rest on the ground or on a plant, their top wings set back in a triangle pattern that helps them hide.

These moths also have a very large proboscis. They use it to reach down into the flowers to drink the nectar. When fully



extended, it can be well over an inch long, and it varies from species to species in total length. Some sphinx moths can have a proboscis that is over several inches to pollinate specific flowers. Each species has adapted to the type of flower that it prefers. When the proboscis is not being used to drink nectar, they roll it up very tightly. It can be seen in the picture on the left, just below the eyes. It is the little semi-circle shaped bump peeking out of the white scales. They can roll this

tube up into a very compact shape and almost make it disappear. This keeps it protected while they are out looking for

more flowers. It also makes it easier for them to move around if it can be stored away.

Overall, these are very beautiful insects that can be very beneficial pollinators. The larvae can be a little destructive, especially in larger numbers, but usually they are not a problem. It is worth your time to try and spot one of these beautiful moths when they are visiting your flowers. They are easy to attract at night with a blacklight as well, if you really want to see one.

### **Dobsonfly**

The dobsonfly is a rarely seen insect here in Grand Junction, even though it is very common. The larvae are all over the place in the fast-flowing riffles and rapids of the Colorado and Gunnison Rivers. This insect is mostly nocturnal, and once you see one in person, they are hard to forget. The adults are very large insects that are easily confused with dragonflies when they are flying. Upon closer inspection, they have larger bodies and impressive jaws that make them quite different. They are even in completely different orders.

The most common species here in Mesa County is *Corydalus texanus*. There are other species, but that is what is pictured in this booklet. These insects are excellent at hiding during the day in the leaves of trees. At night, they will come



out and fly around to look for mates. They are often found down by the river, and they do not live long. This can make them difficult to spot.

The adult females lay eggs on bridges and other structures that are above the water's surface. When the eggs hatch, the larvae can fall into the water to begin their life. The larvae will then attach themselves to the bottom of rocks in areas where the water is moving swiftly. They are predators of other invertebrates, and sometimes very small fish. They sit and wait for organisms to come by, and then they will grab them and feed upon them. Most people have never seen the larval stage of this insect, and they are quite shocked to know that they are in the rivers. The larvae can get quite large, over three inches, and their mandibles make them look quite aggressive. They can bite people to avoid capture, but they do not actively attack humans. It can be quite startling to see an insect this big when playing down by the rivers or streams.

The larvae are voracious predators of other invertebrates in the water. They sit and wait for other insects to get washed towards them in the fast-flowing water, then they attack. They have large jaws that can easily grab and tear apart most small insects. The common name for these larvae is a Hellgrammite, and they can live for years in the river. When they finally mature, they will pupate on land close to the water. If you place a very fine mesh net downstream and disturb the rocks above that net, there is a decent chance that you will capture a hellgrammite. It is very hard to keep one of these larvae alive in a home aquarium though, because they need constant, fast flowing water to live.



The adult Dobsonfly can look quite terrifying because of their largemouth parts. Especially the males, they have very large jaws that look painful, but they do not bite people. The females can cause a painful bite, but they very rarely do. The



male's mouthparts are only used for mating even though they are much larger. It is commonly thought that these adult insects don't even eat. They spend all their time looking for a mate then laying eggs. The larvae on the other hand can use their sharp mouth parts to bite if threatened. Since the larvae are such active feeders, they have strong jaws for grabbing prey. Their jaws as well as their numerous gills can help identify them. The feathery gills are under their long abdomens. The hellgrammites abdomens are also quite spikey on the sides. They only have six legs, just like other insects, but these spines can make it look like they have more.

These insects are incredibly interesting, and they are excellent generalist predators. The larvae will eat numerous other insects, really any that gets too close to them. They are not beneficial or detrimental to humans. They are truly neutral, and they will just eat any other insect. The adults are not a pest at all. They do not disturb people at home, or when they are out hiking. Most people don't even know that they exist in nature,

but it's a good idea to keep an eye out for these amazing little creatures.

## Windscorpions

The final arthropod that we will talk about in this booklet is not actually an insect. It is an arachnid like a spider or a scorpion. Windscorpions are often deeply misunderstood due to their aggressive looks. The species that we have here in the booklet is *Hemerotrecha fruitana*, but there are several species here in Grand Junction that are very similar. There have also been many videos on the internet that exaggerate the size of these

arachnids.

Their common name is Camel Spider, and even though they are larger in other parts



of the world, the stories have been greatly aggrandized. They will put on a display to show how ferocious they are, but they usually won't bite people. They will raise their front appendages and try to make themselves look bigger. They might even walk towards you to make you run away. Most people will leave them alone as soon as they do this gesture. If they are picked up and held tight, they will bite as a last resort. This bite can break the skin, and it is quite painful. They use their aggressive looking mandibles to attack other animals. These little creatures will feed on other insects as well as any small vertebrates, e.g. lizards, that they can catch. One reason that these arachnids look so ferocious, is due to their large pedipalps. These appendages look like legs for the most part, but they can be maneuvered in any direction to help the windscorpion look for its prey. The pedipalps are the main sense organ for them. These organs let them know where the prey went and which

direction to look for them. These arthropods are excellent predators, and they can help eliminate insect pests. They are generalist predators though; they will usually eat whatever they catch. This means that they might be eating beneficial insects that most people would want around their house.



They are not venomous, but since they still hurt, it is best to not pick one up with your bare hands. They are common to see at night in the desert. They can be seen up on the Monument or even north of town along the Bookcliffs. They are



completely different from any other little arthropod that you might find. They do not have the long stinging tail of a true scorpion, and they have much longer pedipalps that separate them from spiders. Their abdomens are much larger than a true scorpion, and they are more elongated compared to a spider. Since they have eight legs, it's easy to separate them from any other insects as well.

These arachnids are quite interesting to see. It is best to just leave them alone, and don't go looking for them. Regular scorpions are probably in the same area. The windscorpion is a beneficial generalist predator that can help around your home, it is not something to be feared. Just respect its distance and know that it is helping remove pests from the Grand Valley.

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I hope this little guidebook has helped you learn more about the insects in our Grand Valley. There are so many interesting creatures that are just right out your back door, and a lot of them are quite beneficial. Even the annoying mosquito has its place in nature that provides a service for all other animals. Controlling them and protecting yourself from getting bitten is still incredibly important but learning about them can be just as valuable. Local mosquito control agencies are always willing to help, and they can probably reduce the number of mosquitoes in your yard as well. Just knowing what type of mosquito is biting you, can provide some peace of mind when it comes to disease transmission. Learning that the major swarms down by the Rivers are usually not a problem, is a huge blessing.

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