KISSING BUGS & CHAGAS DISEASE

What You Need to Know

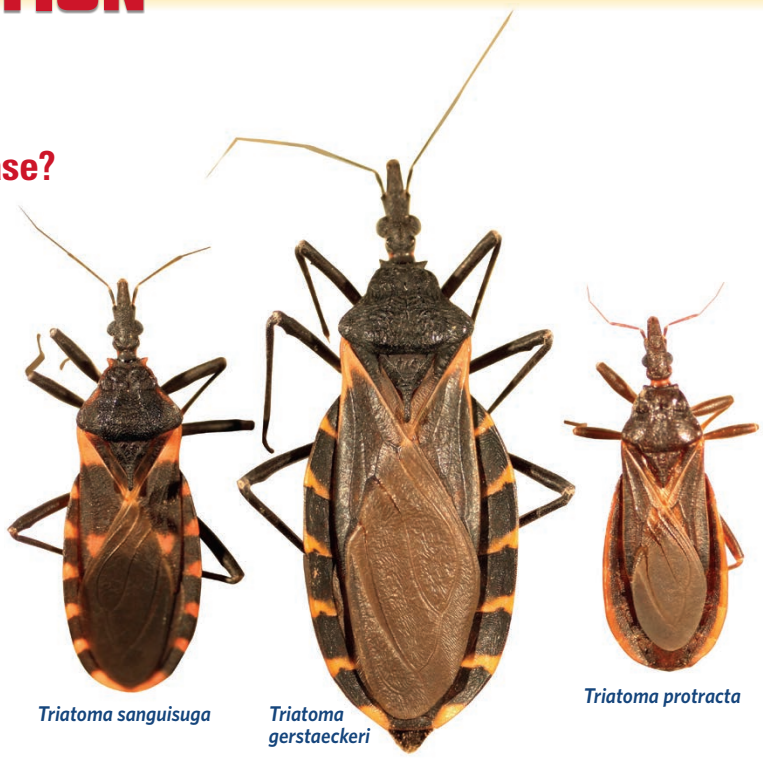
UTHealth | School of Public Health San Antonio

AGRICULTURE & LIFE SCIENCES TEXAS A&M UNIVERSITY

VETERINARY MEDICINE & BIOMEDICAL SCIENCES TEXAS A&M UNIVERSITY

INTRODUCTION

What is Chagas disease?



Three species of kissing bugs found in the southern U.S.

Chagas disease, also called American trypanosomiasis, is a potentially deadly disease caused by the parasite *Trypanosoma cruzi* (or *T. cruzi* for short). This parasite is spread to people and animals by the feces of insects called triatomines, also more commonly known in the United States (U.S.) as kissing bugs. These insects are found all around the world including the southern half of the U.S., but the parasite that causes Chagas disease is only found in the Americas. Chagas disease is found in many parts of Latin America, especially where people live in poor housing conditions that result in close contact with the insects. Although rare, it is also possible to get the disease in the U.S. An estimated 300,000 people with Chagas disease are living in the U.S. However, this is an estimate from infections that originate from Latin America and does not take into account people who may have been infected in the U.S.

Chagas disease is a neglected tropical disease, or an illness that has not received much attention from research or medical communities, despite the fact that it affects millions of people. Chagas disease can be difficult to identify, and many of the people who have the disease do not have symptoms until years or even decades after being infected.

Chronic, or long-term effects of Chagas disease can result in significant heart or digestive system problems. The most commonly reported signs of advanced Chagas disease are cardiac problems, such as heart failure, an enlarged heart, altered heart rate/rhythm, and cardiac arrest (sudden death). If left untreated, the infection is lifelong and life threatening. If you have been in close contact with kissing bugs, especially in areas of Mexico, Central America, or South America, or if you have a family member who has tested positive for *T. cruzi* infection, you should contact your health care provider to determine if you should be tested for Chagas disease.

How do you get Chagas disease?

Chagas disease is spread mainly by the feces of an infected kissing bug. The feces contain the parasite that causes Chagas. When the blood-feeding kissing bug bites a person or animal, it may defecate and leave its feces near the bite site or near an eye, mouth, or nose. Because the parasite is in the bug feces, when the person or animal scratches the area, the parasite enters the body though the bloodstream, causing infection. Chagas disease can also be spread through blood transfusion, organ transplantation, from an infected pregnant mother to her unborn baby, or (in rare cases) by eating contaminated food or drinks that contain the kissing bug feces.

Chagas in Texas

In Texas, cases of Chagas disease are reported to the Texas Department of State Health Services so that the numbers can be tracked. From the years 2013-2016, 91 cases of Chagas disease were reported in Texas. Of those cases, 20 people were infected while in Texas, and the other cases were probably acquired outside of Texas or the U.S. While there are not very many cases, many people may be living with the disease and not know it.

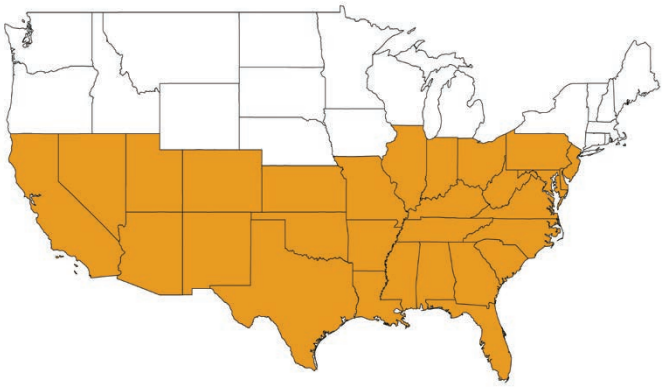
FACTS ABOUT CHAGAS

- The World Health Organization estimates as many as 6 to 7 million people throughout North, Central, and South America are infected with the parasite that causes Chagas disease.
- Many people with Chagas disease may not be aware that they are infected.
- Most infections occur in Latin America, but Chagas disease is present in the United States. As of 2017, five states (Arizona, Arkansas, Louisiana, Tennessee, and Texas), require doctors to report cases of Chagas disease to their state health department.
- Most U.S. blood banks have been screening first-time blood donors for *T. cruzi* infection since 2007.
- The parasite that causes Chagas disease can be transmitted by the feces of a kissing bug, through blood transfusion, organ transplantation, from pregnant mother to baby, or rarely by contaminated food or drink.

KISSING BUGS

What are kissing bugs?

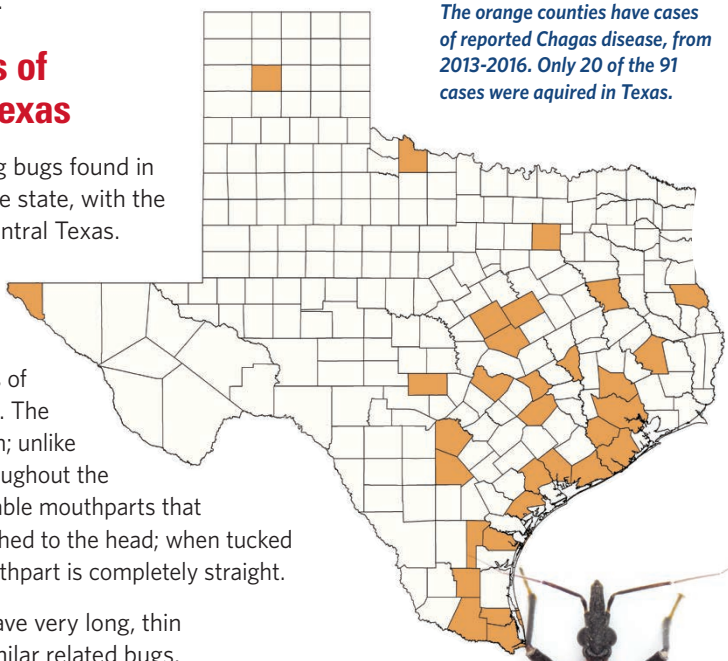
Kissing bugs are insects that can carry *Trypanosoma cruzi*, the parasite that causes Chagas disease. Kissing bugs are also known as triatomines, cone-nose bugs, or chinches. Kissing bugs usually feed on blood during the night, when animals or people are asleep or inactive. They are called kissing bugs because they sometimes bite people on the face.



Kissing bugs are found across the southern US. All of the orange states have at least one report of kissing bugs. Hawaii is not included in this map, but Hawaii has also had reports of kissing bugs.

Where are kissing bugs found?

Kissing bugs are found in the Americas including the U.S., Mexico, Central America, and South America. In the U.S., kissing bugs live in many southern states. There are 11 different kinds of kissing bugs in the U.S. Most of the reports of the different kissing bugs have come from Arizona, California, New Mexico, and Texas. Kissing bugs have been found and documented in the U.S. as early as the mid-1800s. They are not a new species of bug in the U.S.



The orange counties have cases of reported Chagas disease, from 2013-2016. Only 20 of the 91 cases were aquired in Texas.

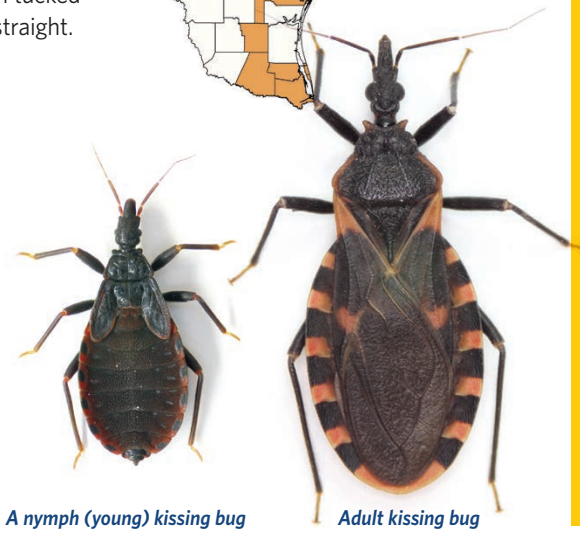
TEXAS: Characteristics of kissing bugs found in Texas

There are seven species of kissing bugs found in Texas. They are found across the state, with the most variety of species found in central Texas.

Adult kissing bugs range in size, but are usually about the size of a U.S. quarter. Most species have a characteristic band around the sides of the body that is either orange or red. The legs of kissing bugs are long and thin; unlike similar insects, the legs are thin throughout the whole leg. Kissing bugs have noticeable mouthparts that appear as a large black needle attached to the head; when tucked under the body, the needle-like mouthpart is completely straight.

Kissing bugs are slightly flat and have very long, thin heads when compared to other similar related bugs. Kissing bug nymphs (immature, young insects) are smaller than adults, and range in size from the size of a poppy seed to almost 1 inch long. They have a 'tear-drop' body shape, with a pointy head and rounded bottom.

A kissing bug at any stage in its lifecycle can spread *T. cruzi* infection; however, kissing bug nymphs are much less likely than adults to be infected. Not all kissing bugs are infected with the parasite; however, research out of Texas A&M University suggests that one in two kissing bugs in Texas are infected with the parasite.



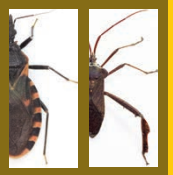
A nymph (young) kissing bug *Adult kissing bug*

PROMINENT KISSING BUG CHARACTERISTICS

- **Size** – adult kissing bugs are one half to one-and-a-quarter inches long

- **Head shape** – kissing bug heads are long-thin (cone-shaped); narrow at the tip and widen slightly to where they attach to the body

- **Legs** – kissing bug legs are long and thin, with no bulging parts.



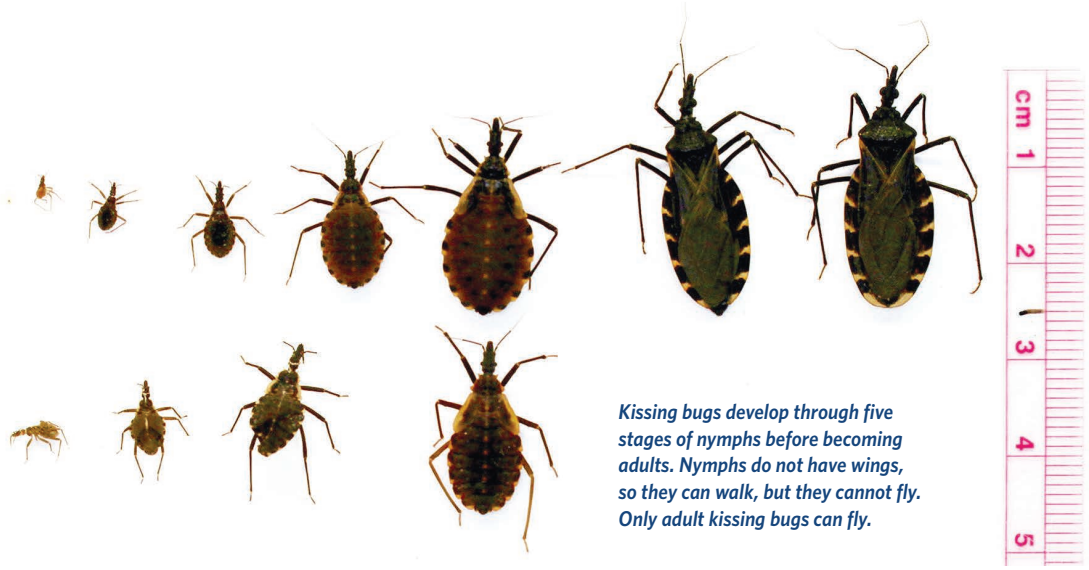
Kissing bug *NOT a kissing bug*

- **Color** – all kissing bugs are dark brown and/or black; they are not grey and they do not have tiny spots; most United States species of kissing bugs have orange/red stripes or solid orange/light brown around the outside part of their bodies.

Kissing bug *NOT a kissing bug*

- **Mouthparts** – a kissing bug's mouthparts are usually kept hidden underneath its head; the mouthpart is long and thin (like a needle); but not thick or curved.

KISSING BUGS



Kissing bugs develop through five stages of nymphs before becoming adults. Nymphs do not have wings, so they can walk, but they cannot fly. Only adult kissing bugs can fly.

Kissing bug life cycle

Adult kissing bugs are mostly active in the warmer months, from May to October. Kissing bugs develop into adults after a series of five life stages as nymphs, and both nymphs and adults feed on blood. Kissing bugs feed on humans as well as wild and domestic animals and pets. They can live between one to two years from when they hatch out of the egg, through all five of the immature nymph stages, until they become adults and eventually die. Kissing bugs take many blood meals from various hosts throughout their lives. These hosts may include humans, dogs, wildlife, chickens, and more.

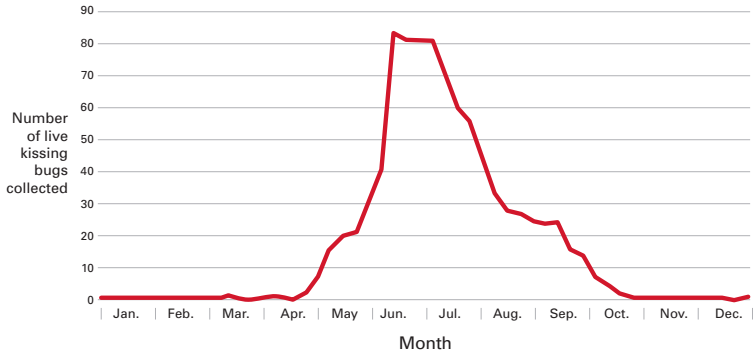


Chart showing kissing bug activity by months in the year

Adult kissing bugs are more likely to be found walking than flying, but they can fly, and may be able to fly distances of up to 3.5 miles.

Look-alike bugs

Kissing bugs are members of a group of insects also known as 'true bugs.' Many other true bugs look similar to each other but do not feed on humans or other animals. Instead, these look-alike bugs feed on plants or other insects. These look-alike bugs occasionally bite humans, and their bites may be painful, but bites from look-alikes ***do not*** pose a risk for transmission of *T. cruzi*. Only kissing bugs are known to transmit the parasite that causes Chagas disease.

Commonly known as a leaf-footed bug, Coreidae is NOT a kissing bug.

Microtomus purcis — common name assassin bug — is NOT a kissing bug.

Another type of assassin bug, Pseudozelurus arizonicus is NOT a kissing bug.

KISSING BUG HABITATS

Kissing bugs typically come out at night and are attracted to lights. They can be found indoors or outdoors, and prefer hiding places such as cracks and openings of buildings and homes. They live in a variety of outdoor settings during the day, including:

- Beneath porches
- Between rocky structures

- In spaces under cracked cement

- In rock, wood, or brush piles

- In rodent nests and animal burrows
- In dog houses and kennels
- In chicken coops

Kissing bug control

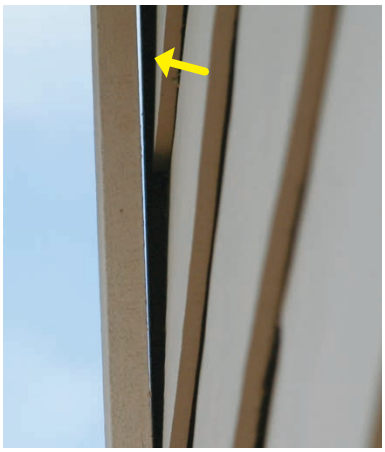
Kissing bugs mainly come out at night and are attracted to outdoor lights. A single kissing bug may be attracted to house lights and enter a home, but a single bug is not necessarily cause for alarm. However, the presence of nymphs or a large number of adults in a house suggests that a breeding population may have formed nearby. Under such circumstances, insect or vector control may be justified. Integrated Pest Management (IPM) strategy is a good approach to controlling unwanted insects, such as kissing bugs. IPM is a method used to address the problem in multiple ways that may include the use of chemicals, cleaning, plugging up holes, etc.

Kissing bug found in camping barracks

Kissing bug infestations are more common in older, poorly constructed, or damaged homes; cleanliness and tight building construction can limit infestations.

Insecticides can effectively control kissing bugs when used appropriately and with other IPM practices. Consider using a licensed pest control professional for kissing bug control. There are no household insecticides labeled specifically for use against kissing bugs; however, some products labeled for indoor use against other indoor pests may be used. Some pesticides require an applicator's license and should only be used by pest professionals or other licensed individuals. Treat windows and doorframes, room corners and edges, pet houses, and other suspected places with a pesticide labeled for these sites. Sticky traps can also be effective in animal housing, buildings, or areas with high infestations.

Kissing bug on side of home



Kissing bug hiding inside crack of siding

KISSING BUG DEFENSE

A few tips to help reduce the places kissing bugs might be living in or around your home or pets:

- Remove piles, excess leaves, and animal nests or burrows around the home to reduce the areas where kissing bugs might find blood or shelter.
- Keep woodpiles away from the house and, if possible, place above the ground.
- To protect pets such as dogs or cats, bring them in at night or keep them in a well-sealed place.
- Get rid of pests, such as wild rodents and birds living under or in the house, in consultation with pest management professionals.
- Seal outside cracks or openings into buildings and homes, especially around windows and doors leading inside from outside, and any openings from crawl spaces into the house sub-flooring. Use silicone sealant, caulk, steel wool, copper mesh, or other similar items.
- Keep chimney flues closed when not in use.
- Examine pet bedding for kissing bugs.

KISSING BUG CONTROL

What to do if you suspect you have found a kissing bug?

If you find a kissing bug that has bitten a person or is inside your home, contact your local health department. In Texas, the State Health Department can help you get kissing bugs tested if found in your home or are suspected to have bitten someone. If you find a kissing bug but no one has been bitten by it (for example, the bug was outside your home or in a dog kennel), and would like to have it tested, see the box below for more information.

Contact? — talk to your doctor

If you have had contact with a kissing bug or think you may have Chagas disease, you should discuss your concerns with your doctor, who will examine you and ask you questions (for example, about your health and where you have lived). Chagas disease is diagnosed by blood tests. If you are found to have Chagas disease, your doctor may recommend follow-up monitoring of the heart (electrocardiogram), even if you feel healthy. You might be referred to an infectious disease specialist for more tests and/or for treatment. Because the disease is rare in the United States, many doctors may not be familiar with Chagas disease. It may be helpful to share this document with your provider as well as any details of when and where you may have been in contact with a kissing bug. The Texas Department of State Health Services has developed some useful guidelines and information about Chagas Disease for doctors that is available online at: **https://ww.dshs.texas.gov/IDCU/disease/Chagas/humans/**.

WHERE TO SEND A KISSING BUG FOR TESTING

- Many state health departments accept kissing bugs for testing for the parasite that causes Chagas. However, they must have been found inside the home or be suspected of having bitten someone. In Texas, kissing bugs should be sent to Texas Department of State Health Services (TDSHS). Information about how to submit can be found at this website: **https://www.dshs.texas.gov/idcu/health/zoonosis/Triatominae/**
- If the kissing bug was found outside the home and/or NOT suspected of biting a human, it may be sent to Texas A&M University Kissing Bug Citizen Science Program. Information about how to submit can be found at this website: **http://kissingbug.tamu.edu/Contact/**
- Harris County Public Health Mosquito and Vector Control: **(713) 440-4800**

Resources to learn more about Chagas disease and kissing bugs

- Your State or Local Health Department
- Your doctor for questions about Chagas disease and testing options
- The Centers for Disease Control and Prevention (CDC): **https://www.cdc.gov/parasites/chagas/**
- For PHYSICIANS interested in more information on diagnosis and treatment: **https://www.cdc.gov/parasites/chagas/health_professionals/index.html**
- Center of Excellence for Chagas Disease: **http://www.chagasus.org/**
- Chagas Coalition: **http://www.coalicionchagas.org/en**

Texas-based resources:

- Texas Department of State Health Services: **http://dshs.texas.gov/idcu/disease/chagas/**
- Texas A&M Kissing Bug Citizen Science program: **http://kissingbug.tamu.edu**
- Texas A&M Kissing Bug Control: **http://citybugs.tamu.edu/factsheets/biting-stinging/others/ent-3008/**
- **Texas Chagas Taskforce** (website coming Summer 2018): **http://texaschagas.org**

SAFE KISSING BUG COLLECTION METHODS

Never touch a kissing bug with bare hands and avoid crushing it. The parasites they may have in their gut can be transmitted to humans and other animals. If you see a bug you believe is a kissing bug and would like confirmation of the species identity and to submit it for testing, please use careful methods to collect it:

- A glove or small plastic bag may be used to catch the bug to avoid direct contact. The bug may be stored in a sealed plastic bag, in an empty medicine vial, or other small container.

- All surfaces with which the kissing bug came into contact should be thoroughly cleaned with a 10% bleach and 90% water solution.

When submitting a bug, let the testing lab know:

- Exactly where it was found (inside or outside, city or county)
- Date it was found
- Time of day it was found
- If it was alive when found
- What it was doing at the time it was found

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