

The causative agent of Chagas disease, *Trypanosoma cruzi*, is a protozoan parasite that infects an estimated 24 million people in Central and South America. During 2006, the first indigenous case in Louisiana was reported http://www.loyno.edu/~dorn/Chagas_in_US.htm; <http://chn.loyno.edu/biology/bios/dorn-chagasresearch.html>. This was the sixth indigenous case of vector-borne Chagas reported for the U.S. during the past 52 years. The first three cases occurred in Texas in infants 2-3 weeks to 10 months of age during 1955 (2 cases) and 1983 (Woody and Woody 1955, Greer 1956, and Ochs et al. 1996). The fourth case occurred in California during 1982 in a 56 year old individual (Navin et al. 1985). The fifth case during 1998 in Tennessee involved an 18 month old infant (Herwaldt et al. 2000).

Chagas disease is a zoonotic disease, which means that it is a disease of animals that is transmitted to man under some conditions. This also means that man is not an important reservoir of the disease agent. *Trypanosoma cruzi* is known to infect over 100 species of vertebrates. The causative agent of Chagas disease is vectored among a variety of vertebrate hosts by triatomine bugs called kissing bugs of the family Reduviidae, order Hemiptera. Most members of this family are predators of other insects and are called assassin bugs, but members of the triatomine group, commonly known as kissing bugs, feed on vertebrate blood. Kissing bug adults are relatively large (approx. 1 inch), somewhat flattened, winged insects. Immature stages are smaller, lighter in color, and wingless (Fig. 3). Twelve species of kissing bugs are known to occur in the U.S., the most important being *Triatoma sanguisuga* (Fig. 1) in Louisiana and the rest of the eastern and southeastern U.S. Important vectors in other areas include *T. gerstaeckeri* (Fig. 2) in Texas and New Mexico, and *T. rubida* and *T. protracta* in Arizona and California. *Triatoma sanguisuga* has been found naturally infected with the etiological agent of Chagas disease in Alabama (Hays et al. 1961), Louisiana (Yaeger 1961), Georgia (Pung et al. 1995), Florida (Beard et al. 1988) and Tennessee (Herwaldt et al. 2000).



Fig. 1. *Triatoma sanguisuga*, adult from Louisiana (Louisiana State Arthropod Museum, LSAM).

Fig. 2. *Triatoma gerstaeckeri*, adult from Texas (LSAM).



Fig. 3. Second, third, and fourth stage nymphs (immatures) of *Triatoma gerstaeckeri* from Texas (LSAM).

The majority of the animal infections in the U.S. are thought to occur when the animals eat an infected bug. We have known for over 50 years that a high incidence of *Trypanosoma cruzi* occurs in small mammals in Louisiana (raccoons and opossums being the most common), and that our local bugs have a similar infection rate to that of bugs in South America. Although most of the transmission of *T. cruzi* to small mammals is associated with ingestion of the bugs, the organism is transmitted to man by bugs that feed on sleeping victims; the organism is passed to man in the feces of the bugs that defecate while they feed. The infection of the bugs associated with humans most likely

comes from feeding on other animals that have much higher levels of the parasite than man. Chagas disease is not a problem in the United States for two major reasons. First, the bugs that occur in Louisiana and other parts of the U.S. do not defecate until approximately 30 minutes after they complete their feeding and thus do not pass the organism to man or animals while they feed. Secondly, the main reason that Chagas disease is important in certain regions is because people live in dwellings that harbor bugs. For example, thatch roofs do not exclude bugs and provide shelter for the ones that enter homes. The highest priority in controlling Chagas disease in the World is improving housing, not bug control.

A report of an indigenous case of Chagas disease is important; but by itself, should not be alarming for the following reasons and with the following caveats:

1. The most important vector of the causative agent of Chagas disease in the Southeast is *Triatoma sanguisuga*, which is not a domestic or peridomestic insect. However, these bugs are attracted to lights and will hide in wood piles and similar debris around houses. These bugs do feed on dogs and other domestic animals and will accumulate in hiding places around their enclosures. Therefore, reducing the hiding places for bugs around houses and animal enclosures close to houses can reduce potential contact with these bugs. Of course, perimeter sprays with appropriate insecticides also can aid in the reduction of these and many other pests.
2. Humans are exposed to the causative agent of Chagas disease by contact with the feces of kissing bugs. In areas where Chagas disease is important, kissing bugs feed on and defecate on sleeping humans, and the agent enters the feeding lesion or other entry points due to rubbing of the skin by the victim. Even if kissing bugs feed on humans in Louisiana, they do not defecate until they leave the host. The feces of kissing bugs should be considered as a source of infection at any time, since the organism can penetrate mucosal membranes. Therefore, capturing and handling kissing bugs should be avoided.
3. Occasional isolated occurrences of kissing bugs are not cause for concern. They should not be molested if seen outdoors. Also, numerous other bug species are superficially similar. Some common species that may be confused with kissing bugs in Louisiana or elsewhere in southcentral U.S. are pictured below (Figs. 4-9). Also be aware that most members of the assassin bug family are predators and many are capable of delivering a painful bite if handled. Being bitten by one of these other assassin bugs is unpleasant, but will not result in contracting Chagas disease. If you suspect that you have a population of kissing bugs nearby, do not attempt to collect them. Contact a local Cooperative Extension Agent and ask them to communicate the problem to a professional entomologist for advice on a possible course of action.

For more information on Chagas disease:

http://www.cdc.gov/ncidod/dpd/parasites/chagasdisease/factsht_chagas_disease.htm

For instructions on submitting specimens or digital photographs to the Louisiana State Arthropod Museum for identification and diagnosis:

<http://entomology.lsu.edu/lam/public.htm>



Fig. 4. *Microtomus percis*, a large colorful predatory assassin bug that can deliver a painful bite if handled (LSAM).

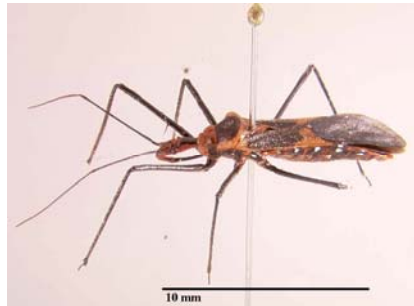


Fig. 5. *Zelus longipes*, a small assassin bug often seen in home gardens and on shrubs (LSAM).



Fig. 6. *Sinea* species are small brown assassin bugs that can be mistaken for immature kissing bugs (LSAM).



Fig. 7. *Melanolestes picipes*, a solid black assassin bug often found in rotting logs



Fig. 8. *Largus succinctus*, a harmless plant bug in the family Largidae (LSAM).



Fig. 9. *Leptoglossus fulvicornis*, a large, harmless "leaf-footed bug" that

and under bark (LSAM).		often congregates on houses during fall and winter.
------------------------	--	---

Literature cited

Beard, C.B., D.G. Young, J.F. Butler, and D.A. Evans. 1988. First isolation of *Trypanosoma cruzi* from a wild-caught *Triatoma sanguisuga* in Florida, U.S.A. *J. Parasitol.* 74: 343-344.

Greer, D.A. 1955. Found: two cases of Chagas' disease. *Tex. Health Bull.* 9: 11-13.

Hays, K.L. 1965. Longevity, fecundity, and food intake of adult *Triatoma sanguisuga*. *J. Med. Entomol.* 2: 200-202.

Hays, K.L. 1965. The frequency and magnitude of intraspecific parasitism in *Triatoma sanguisuga*. *Ecology* 46: 875-877.

Hays, K.L., P.F. Olsen, H.F. Turner. 1961. Chagas' disease in Alabama. *Highlights Agric. Res.* 8: 4.

Herwaldt, B.L., M.J. Grijalva, A.L. Newsome, C.R. McGhee, M.R. Powell, D.G. Nemeč, F.J. Steurer and M.L. Eberhard. 2000. Use of polymerase chain reaction to diagnose the fifth reported US case of autochthonous transmission of *Trypanosoma cruzi*, in Tennessee, 1998. *J. Inf. Dis.* 181: 395-99.

Navin, T.R., R.R. Roberto, D.D. Juranek, K. Limpakarnjanarat, E.W. Mortenson, J.R. Clover, R.E. Yescott, C. Taclindo, F. Steurer, and D. Allain. 1985. Human and sylvatic *Trypanosoma cruzi* infection in California. *AJPH* 75: 366-369.

Ochs, D.E., V.S. Hnilica, D.R. Moser, J.H. Smith, and L.V. Kirchhoff. 1996. Postmortem diagnosis of autochthonous acute chagasic myocarditis by polymerase chain reaction amplification of a species-specific DNA sequence of *Trypanosoma cruzi*. *Am. J. Trop. Med. Hyg.* 54: 526-9.

Pippen, W.F. 1970. The biology and vector capability of *Triatoma sanguisuga texana* and *Triatoma gerstaeckeri* compared with *Rhodnius prolixus*. *J. Med. Entomol.* 7: 30-46.

Pung, O.J., C. W. Banks, D.N. Jones, and M.W. Krissinger. 1995. *Trypanosoma cruzi* in wild raccoons, opossums, and triatomine bugs in southeast Georgia, U.S.A. *J. Parasitol.* 81: 324-326.

Yaeger, R.G. 1961. The present status of Chagas' disease in the United States. *Bull. Tulane Med. Fac.* 21: 9-13.

Woody, N.C. and H.B. Woody. 1955 American trypanosomiasis (Chagas' disease): first indigenous case in the United States. *JAMA* 159: 676-7.