School & Home Integrated Pest Management (IPM) Newsletter – June 2021

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What do you know about kissing bugs

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The kissing bug is a large, dark brown or black hemipteran (true bug) with patterns and markings that vary by species, which range in size from 0.5 to over 1 inch (13.0 – 33.0 mm) in length. Kissing bugs get their name because they often bite sleeping human victims on the face. They are also known as conenose bugs, Triatomine bugs, Mexican bed bugs, and Hualapai (or Wallapai) tigers. Although kissing bugs are in the same insect order as bed bugs and both feed on blood, they have different life histories.

Though the bites are generally painless, they can cause intense itching and tenderness at the bite site, which can become swollen and reddish to purple. The irritation may last one to two weeks, but sensitive individuals may experience more severe or prolonged reactions. With multiple subsequent bites, anaphylaxis may occur and may be potentially life threatening. Individuals who experience an allergic reaction should seek immediate medical attention. Who would suspect that an insect with a nickname of “kissing bug” could cause life threating allergic reactions (anaphylaxis) in sensitive individuals!?!

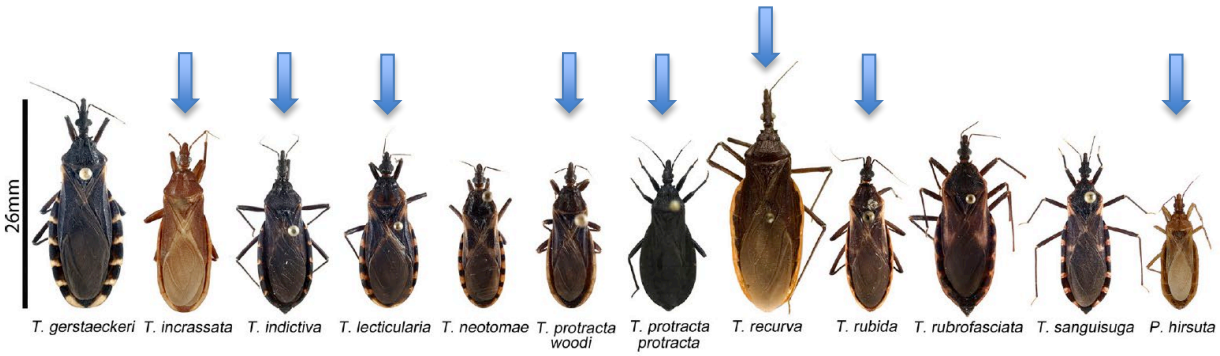

Figure 1. Photographs of 11 triatomine vector species of the genera *Triatoma* and *Paratriatoma* in the United States (Bern et al. 2020). Two subspecies of *Triatoma protracta* (*protracta* and *woodi*) are featured in the image. Arizona triatomines are indicated with the blue arrows. Image size relative to the scale bar represents the average length of each species. Photo courtesy of E. Barrera Vargas, R. Hoey-Chamberlain, C. Weirauch, G. Lawrence (DPD/CDC) and S. Kjos.

There are 11 species of kissing bugs in the U.S., of which 7 species in the genera *Triatoma* and *Paratriatoma* are found in Arizona (Figure 1) (Klotz et al. 2014). The most

troublesome and numerous species associated with human dwellings in Arizona are: ***Triatoma rubida*** (Figure 2), ***T. protracta*** (Figure 3) and ***T. recurva*** (Figure 4) (Wood 1950, Ekkens 1981, Reisenman et al. 2010, Klotz et al. 2014).

- *T. rubida*, although found throughout Arizona, is most prevalent in the foothill regions of Phoenix and Tucson; shown in Figure 2;
- *T. protracta* is common in Madera Canyon, Pima County, and Coconino County; shown in Figure 3;
- and *T. recurva* is easily found in Madera Canyon, Sabino Canyon, and Santa Catalina Mountains; shown in Figure 4.
- The Arizona Sonora Desert Museum in Tucson, AZ, one of the top ten zoological parks in the world, supports large populations of *T. rubida* and *T. protracta* (Klotz et al. 2014).

In general, *T. rubida* is larger than *T. protracta*, and is easily distinguished by the reddish or brownish-red lateral markings on the abdomen seen just outside the folded wings. *T. recurva* is the largest among the three common species, with pronotum uniformly dark colored and strongly up-curved edges of its wide abdomen.

Figure 2. Adult female *Triatoma rubida*, the most abundant species of kissing bugs in Arizona. Scale bar = 1 cm. Photo courtesy C. Hedgcock.

Figure 3. Adult western bloodsucking kissing bug, *T. protracta.* Collected in Flagstaff, Coconino County, AZ and the Museum of Northern Arizona as host for specimens. Photo courtesy Gary Alpert.

Figure 4. Adult *T. recurva*. Photo courtesy Charles Bradley. The University of Arizona Insect Collection as host for specimens.

Biology and life history

Kissing bugs live and breed outdoors, and are often associated with the nests of *Neotoma* woodrat species (also called pack rats), and other wildlife. However, they can also be associated with domesticated animals, and found in the bedding of doghouses and chicken coops.

They fly well and are attracted to lights after dark. In suburban and rural Arizona, the insect is often attracted to porch lights. At dawn, it may seek a way to avoid sunlight and heat, and may enter a residence through a doorway gap, or cracks around window screens. They also enter homes by moving up from crawlspaces beneath flooring. Once inside, the insect moves toward areas of low light intensity, hiding in and under furniture (between mattresses is a favorite hiding place) and in closets during the daytime hours.

Kissing bugs are most commonly encountered during their dispersal season, May through July, as adult kissing bugs fly towards home-related lighting (Wood 1950, Ekkens 1981). They actively seek out humans and domestic animals to feed on. They are attracted to the gases we exhale, skin odors, and to the warmth of our bodies. Feeding occurs mainly at night, after which they tend to move away from the host. Engorged bugs are often found amongst bedding and drapes close to the bed in the morning.

The kissing bug life cycle begins with the spring or summer nighttime dispersal flight of adults from rodent burrows and dens. Eggs are laid in rodent nests in summer or early fall and they hatch in three to five weeks. The newly hatched nymphs pass through five immature nymphal stages before turning into mature adults (Figure 5), and each stage requires a full blood meal to develop to the next stage.

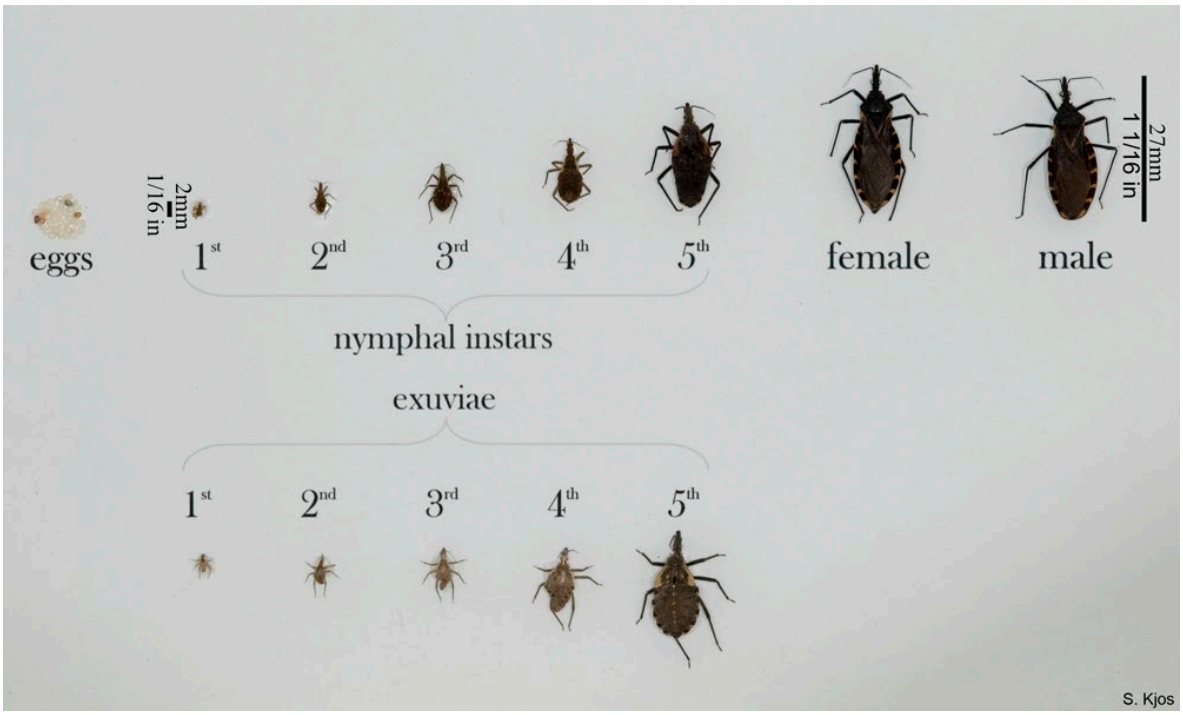

Figure 5. Various kissing bugs in all life stages, from eggs to nymphs to fully grown adults. A variety of bug species, that share similar traits, are pictured. Source: CDC, Global Health - Division of Parasitic Disease.

Blood is taken rapidly with feeding lasting 10 to 30 minutes. Fully engorged bugs can take one to five times their weight in blood, and the bugs will feed about every one to two weeks when hosts are available and temperatures are warm. Adults live into mid- to late autumn. Kissing bugs overwinter as developing nymphs and molt into adults in spring.

Females can lay up to several hundred eggs over their lifespan depending upon conditions. Active dispersal is achieved by flight in adults, usually around dusk and early evening. Immature kissing bugs can't fly but crawl when stimulated to find a food source.

Kissing bug bites and health concerns

In parts of southern and central South America, kissing bugs are the primary vectors of chagas disease, which is a severe, often lethal disease caused by the protozoan *Trypanosoma cruzi*. Unlike many mosquito and tick vectored pathogens, the kissing bug bite does not transmit the *T. cruzi* parasite. The protozoan is transmitted in their feces, which are scratched into the bite wound, ingested, or rubbed into moist tissues around the eyes, nose, and mouth.

Incidence of chagas disease is low in the U.S., even though many species of kissing bugs carry *T. cruzi* in their gut. Studies (Reisenman et al. 2010) have shown that about 40% of the kissing bugs around Tucson, Arizona are infected with *T. cruzi*, but so far they have not been shown to transmit it to humans. Researchers attribute the low incidence of chagas disease in the continental U.S. to poor efficacy of protozoan transmission by the bugs, infrequent human contact, and inability of the bugs to permanently colonize homes. However, it is important to recognize that higher populations of kissing bugs might be indicative of higher incidences of chagas disease. Reports of increasing numbers of chagas disease cases in dogs have been reported in southern Texas (Reisenman et al. 2010). Overall, chagas has been increasingly detected in the U.S., Canada, many European, and some Western Pacific countries. This is however likely due to increased population mobility between Latin America and the rest of the world.

Kissing bug bites usually occur at night, and are grouped as several bites on the face, neck, arms, legs, and sometimes on the chest or other body parts. Bites are initially painless because the insect saliva contains an anesthetic, but might soon itch, swell, and cause a substantial welt that can last for several days. More severe reactions range from huge, painful welts to allergic reactions, including difficulty in breathing, low blood pressure, and rapid heart rates due to anaphylaxis. Kissing bug bites can be confused with bites from other pests such as mosquitoes or bed bugs because the reactions can look similar.

The biggest risk kissing bugs pose is one of severe allergic reaction. Some people develop a severe or life-threatening allergy to them after multiple bites. This makes it very important to avoid additional bites.

Call 911 if you have symptoms of severe allergic reaction.

If you are bitten by a kissing bug, you should clean the bite site with soap and water. Oral antihistamines like diphenhydramine (e.g., Benadryl), topically applied 3-4% ammonia solution, and bathing in Epsom salts solution may help control itching. **Severe reactions require medical treatment.** Bites cannot be identified in the absence of an insect. If you find the bug, scoop the specimen up and put it in a container to take with you when seeking medical attention. Emergency allergy kits often are prescribed for patients who suffer severe reactions to use in case of future bites.

CDC is offering *Trypanosoma cruzi* testing of kissing bugs that come in contact with humans. They offer identification via submission of a picture and testing for bugs identified as triatomine (agent of Chagas disease). Please email vbzd@azdhs.gov for approval with the following information:

- MEDSIS ID if available (or person name, address)
- The location of where the bug was found
- Information about the exposure

If approved, the triatomine bug can be sent to the Arizona State Public Health Lab (using the Environmental Submission Form) which will forward it to CDC. Approximate turnaround time for testing is at least 3 weeks.

Integrated pest management guidelines for kissing bugs

Pest-proofing your home is the best preventative measure against kissing bug bites.

An attempt should be made to reduce the number of kissing bugs present in and around the home.

1. First, vacuum up all visible insects from indoor areas, concentrating on cracks and crevices, drapes, and beddings.
2. Seal all cracks and openings into buildings as completely as possible. Use weather stripping, door sweeps, and silicone seal to eliminate small cracks and crevices.
3. Screen all windows, doors and vents.
4. Inspect outside for hidden bugs, look beneath flowerpots and outdoor furniture, and any other dark, sheltered places.
5. Pest management professionals can remediate rodent nests under, against, or near buildings (within 350 feet). Only remove those nests close to homes. By leaving distant nests intact, the kissing bug has an alternative site to inhabit, which can discourage migration into the home.
6. Eliminate harborages including piles of lumber, firewood, and debris around buildings.
7. If you have pets, have your pets sleep indoors, especially at night.
8. Since these bugs fly at night and are attracted to light, keep doors closed and drapes pulled after dark, move inside lights away from doors and windows. Curtains should be drawn in lighted rooms at night.
9. Change external and porch lights to LED lights that do not emit U.V. light to a great extent, so are not attractive to insects.

10. Regularly examine dark, quiet areas in the home mid-spring to mid-fall, especially sleeping areas.
11. **A bed net, tucked under a mattress, is the best exclusionary device for those sensitized and at risk for anaphylactic shock.**

For more information, please read:

Li, S., Gouge, D.H., Nair, S., Fournier, A. and Hall, W.E. 2019. Arizona Kissing Bugs. University of Arizona Cooperative Extension. AZ1787. https://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1787-2019.pdf

Gouge, D.H., Nair, S., Li, S. and Stock, T. 2015. Pest-proofing your home. University of Arizona Cooperative Extension. AZ1677. http://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1677-2015.pdf

References

Bern, C., Messenger, L.A., Whitman, J.D. and Maguire, J.H. 2020. Chagas disease in the United States: a public health approach. Clin Microbiol Rev 33:e00023-19. https://doi.org/10.1128/CMR.00023-19.

Ekkens, D.B., 1981. Nocturnal flights of *Triatoma* (Hemiptera: Reduviidae) in Sabino Canyon, Arizona. I. Light collections. J Med Entomol. 18(3): 211-227. https://doi.org/10.1093/jmedent/18.3.211

Klotz, S.A., Dorn, P.L., Mosbacher, M. and Schmidt, J.O. 2014. Kissing Bugs in the United States: Risk for Vector-Borne Disease in Humans. *Environmental Health Insights,* 2014:8(S2) 49-59. doi: 10.4137/EHI.S16003

Reisenman, C.E., Lawrence, G., Guerenstein, P.G., Gregory, T., Dotson, E. and Hildebrand, J.G. 2010. Infection of kissing bugs with *Trypanosoma cruzi*, Tucson, Arizona, USA. *Emerging Infectious Diseases*, *16*(3), 400-405. http://doi.org/10.3201/eid1603.090648

Wood, S.F., 1950. Dispersal flight of *Triatoma* in southern Arizona. J Parasitol. 36(5): 498-499.

What the Heck was This!

Answer: Longhorn Bees (Dawn, please complete this session)
If you know what these are email the answer to Dawn at dhgouge@email.arizona.edu. You will not win anything if you are correct, but you will be listed as a "Proficient Pest Detective" in the next newsletter issue.

Ongoing and Upcoming Events

Vector Preparedness Virtual Workshop

Open now for on-demand CEs. To register contact Dr. Lucy Li lucyli@email.arizona.edu

The Vector Preparedness Virtual Workshop is a great opportunity for anyone with an interest in learning information on mosquito ID, surveillance, management, and insecticide resistance in public health pests.

Arizona certified structural pesticide applicators can earn **4 CEUs** from the AZ Department of Agriculture's Pest Management Division (PMD) after completing the entire workshop. This course will be effective through August 30, 2021.

Check out upcoming Integrated Pest Management Webinars at https://www.epa.gov/managing-pests-schools/upcoming-integrated-pest-management-

webinars. For more information about the EPA Schools program: http://www.epa.gov/schools/.

To view all our previous newsletters, visit: https://acis.cals.arizona.edu/community-ipm/home-and-school-ipm-newsletters.

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